
Equipment installation and configuration

This chapter describes the installation of the Carrier Remote IPE as an integral part of system options 21E, 51, 51C, 61, 61C, 71, 81, and 81C as well as NT and XT systems.

Quick reference to system installation and configuration

If you are familiar with the system operation and general Meridian 1 installation practices, follow the steps below and refer to Appendix C for connection diagrams, to speed up the installation of the Remote Carrier IPE at the local and remote sites:

- 1 Take inventory of the carrier equipment by comparing the received equipment against the shipping documents. Refer to [Tables 1, 2, and 3](#) in the *Carrier Remote IPE product description* chapter on page 3 for carrier components part numbers and their description.
- 2 Identify empty network card slots, refer to:
 - Table 8 “Meridian 1 modules supporting Local Carrier Interface cards” on page 60 or
 - Table 9 “System cabinet shelves supporting Local Carrier Interface cards” on page 61 and
- 3 Configure the NT7R51 Local Carrier Interface card DIP-switches to set the Local Carrier Interface card address and other parameters. Refer to:
 - Figure 9 “Local Carrier Interface card DIP-switch positions and function” on page 69 for switch settings.
 - Table 11 “NT7R51 Local Carrier Interface card maintenance daisy-chain address” on page 70.

- 4 Install the NT7R51 Local Carrier Interface card into a network card slot:
 - “Installing the Local Carrier Interface card” on page 67, for Meridian 1 system options.
 - “Installing the Local Carrier Interface card” on page 92, for NT/XT systems.
 - Figure 14 “Local Carrier Interface card faceplate cable connections in NT or XT system” on page 93.
- 5 Install the NT7R51 Local Carrier Interface card faceplate connector assemblies. Refer to:
 - “Installing the Local Carrier Interface cable assemblies” on page 71 and
 - Appendix C, [Figure 27](#) and [Figure 28](#), and
 - Figure 10 “Local Carrier Interface card faceplate cable connections in Meridian 1” on page 73 or
 - Figure 14 “Local Carrier Interface card faceplate cable connections in NT or XT system” on page 93 and
 - “Installing Local Carrier Interface faceplate cables” on page 94.
- 6 Install the system monitor, local MMI terminal, and carrier link cables to the carrier and maintenance panel assembly connectors. Refer to:
 - “Installing SDI and local MMI terminal cables” on page 76, and
 - Appendix C, [Figure 31](#).
 - “Connecting the carrier link to the Meridian 1” on page 89, and
 - Figure 11 “System monitor, local MMI terminal, and carrier links cable connections” on page 77.
 - Refer to Appendix C on page 221 for connector pin assignments.
- 7 At the remote site, install the Carrier Remote IPE column or wall-mounted (or pedestal mounted) Carrier Remote IPE cabinet. Refer to:
 - “Installing the Carrier Remote IPE column” on page 103 or
 - “Installing the Carrier Remote IPE cabinet” on page 117.

- 8** Configure the NT7R52 Remote Carrier Interface card. Refer to:
- Figure 15 “Remote Carrier Interface card DIP-switch locations and functions” on page 107 for switch settings and
 - “Installing system monitor cables” on page 113.

Note: For the floor-standing Carrier Remote IPE column, select the system monitor address on the Remote Carrier Interface card and on the System Monitor card in the pedestal. The system monitor address in both places must be the same and a unique number from 0 to 31.

- 9** Install the NT7R52 Remote Carrier Interface card into the **Cont** card slot in the IPE Module or the Carrier Remote IPE cabinet. Also install the power supply and the IPE cards.
- 10** Install the internal cable assemblies. Refer to:
- “Installing the backplane cable assemblies” on page 109 and
 - Appendix C, [Figure 29](#), and
 - Figure 16 “Backplane to I/O panel connections on the IPE module” on page 112 for the Carrier Remote IPE column, or refer to
 - “Installing the NT7R94AA Remote Cabinet Cable Assembly” on page 122 and
 - Appendix C, [Figure 30](#), and
 - Figure 18 “Carrier cable routing for the Carrier Remote IPE cabinet” on page 123 for the Carrier Remote IPE cabinet.

- 11** Install the external cables to the I/O panel. Refer to:
 - “Installing system monitor cables” on page 113 and
 - Appendix C, [Figure 29](#), and
 - “Connecting the carrier link to the Remote IPE module” on page 115 for the Carrier Remote IPE column, or refer to
 - “Connecting carrier links to the Carrier Remote IPE cabinet” on page 125 and
 - Appendix C, [Figure 30](#), and
 - “Connecting remote MMI terminal and subscriber loop cables” on page 128 for the Carrier Remote IPE cabinet.
 - “Verifying carrier link connections at the remote site” on page 147
 - Refer to Appendix C on page 221 for connector pin assignments.
- 12** Configure the Carrier Remote IPE local and remote sites. Refer to:
 - “Configuring the carrier interface cards” on page 133 and
 - “Configuring the remote MMI terminal port” on page 138.
 - “Configuring the carriers” on page 141.
- 13** Conduct system acceptance testing. Refer to:
 - “Carrier Remote IPE acceptance testing” chapter on page 153 in this manual.

Installation overview

Carrier Remote IPE service can be added to existing Meridian 1 system options 21E, 51, 51C, 61, 61C, 71, 81, and 81C originally installed and operating without Carrier Remote IPE, or it can be an integral part of a newly installed Meridian 1 system.

The Remote IPE service can also be added to NT and XT systems with X11 release 21 or higher generic software.

In either case, the connection of the Carrier Remote IPE to the system over T1 or E1 carrier links should begin after a previously installed system, or a newly installed system using generic software X11 release 21 or higher operates correctly. The system must also be equipped with Carrier Remote IPE software package REM_IPE 286. The carrier service has been ordered, installed, and tested up to the telco demarcation point.

To install a new Meridian 1 system or expand an existing one, refer to *Meridian 1 system installation procedures* (553-3001-210). It provides the information on how to install, verify, and maintain the Meridian 1 system.

To upgrade NT and XT systems to X11 release 21 or higher, refer to *Software conversion procedures* (553-2001-320).

Adding one or more Carrier Remote IPE sites to a system is treated as a straightforward system expansion, that is, the system should be fully operational before the Carrier Remote IPE equipment is installed and connected to the system. This simplifies installation and fault isolation during installation.

Carrier Remote IPE is offered in two versions to provide flexibility in line size and equipment location. These are:

- Carrier Remote IPE column
- Carrier Remote IPE cabinet

Note: The Carrier Remote IPE column consists of a pedestal, an IPE module that houses up to 16 IPE cards, and a top cap. The Carrier Remote IPE cabinet may consist of only the main cabinet when 10 or fewer IPE cards are required, or the main and the expansion cabinets when up to 16 IPE cards are required.

To complete the installation of a Carrier Remote IPE site, you should perform the preinstallation procedures to prepare the site before installing and connecting the equipment. The general preinstallation and installation points are listed below. The actual installation procedure steps start in “Meridian 1 equipment installation” on page 66.

Preinstallation procedures include:

- ordering carrier service from telco
- preparing the site
- unpacking and inspecting the equipment
- inventorying Carrier Remote IPE and system carrier equipment
- selecting a network slot for the Local Carrier Interface card

Local site installation procedures include:

- installing the Local Carrier Interface card into the selected network card slot
- installing cables between the Local Carrier Interface faceplate connectors and the I/O panel assembly at the rear of the Meridian 1 module housing the Local Carrier Interface card or the NT or XT system cabinet
- connecting the system monitor daisy-chain, the Meridian 1 host SDI, and the MMI terminal cables at the local system site
- connecting the Local Carrier Interface maintenance cables in a daisy-chain for multiple Local Carrier Interface cards
- connecting the carrier link to the I/O panel assembly

Remote site installation procedures include:

- installing the Carrier Remote IPE column or cabinet
- installing the Remote Carrier Interface card into the Remote IPE module or cabinet controller card slot
- installing cables between the backplane connectors behind the Remote Carrier Interface card and the I/O panel assembly at the rear of the module or the bottom of the Carrier Remote IPE cabinet

- connecting the slave system monitor and MMI terminal cables at the Carrier Remote IPE site
- connecting the carrier link to the Carrier Remote IPE

Preinstallation preparation

Preinstallation preparation consists of preparing the site, unpacking and inspection, taking inventory, selecting the network slot for the Local Carrier Interface card, installing the card, selecting the T1 or E1 carrier link, and preparing the remote site cables, grounding, power source, and the space for the Remote IPE column or cabinets.

Preparing the site

When preparing a site, you must address environmental, structural, and electrical factors. These factors must be considered for the entire system, that is, Meridian 1 and Carrier Remote IPE sites. This information is available in:

- *Meridian 1 installation planning* (553-3001-120)
- *Meridian 1 system engineering* (553-3001-151)
- *Meridian 1 power engineering* (553-3001-152)

Note: The NT and XT systems have been previously installed and are only upgraded for Carrier Remote IPE service. If these systems have been upgraded using Meridian 1 column, you can use the system monitor in the pedestal to process system alarms received from the Carrier Remote IPE site. Without the system monitor in the pedestal, the system alarms from the Carrier Remote IPE site cannot be processed.

To prepare the site for Carrier Remote IPE installation, you must first:

- Install and verify the operation of Meridian 1, without linking Meridian 1 to the Carrier Remote IPE sites. Refer to *Meridian 1 system installation procedures* (553-3001-210). An NT or XT system should have already been installed and must be operational.
- Install the Carrier Remote IPE column. Also refer to *Meridian 1 system installation procedures* (553-3001-210), or

Install the cabinet version of Carrier Remote IPE as described in [“Installing the Carrier Remote IPE cabinet” on page 117](#) in this chapter.

Unpacking and inspection

Unpack and inspect the equipment for damage. When unpacking, follow general precautions recommended by computer and telephone equipment manufacturers:

- Remove items that generate static charge from the installation site.
- Use antistatic spray if the site is carpeted.
- Ground yourself using a wrist strap and an antistatic mat before handling any equipment.
- Remove equipment carefully from its packaging.
- Visually inspect the equipment for obvious faults or damage. Any damaged component must be reported to your sales representative and the carrier who delivered the equipment.
- Hold the plug-in cards by their nonconductor edges and keep them in their antistatic bags until you are ready to install them.
- Do not stack the plug-in cards on top of each other.

Taking inventory

After the equipment has been unpacked and visually inspected, verify that all the equipment is at the site before the installation begins. Equipment received must be checked against the shipping documents. Any shortages must be noted and reported to your sales representative. Refer to [Tables 1, 2, and 3](#) in the *Carrier Remote IPE product description* chapter on page 3 for carrier equipment description.

Routing carrier links to the Carrier Remote IPE site

A carrier link connecting the system to the Carrier Remote IPE can use a private or a public T1 or E1 network. The carrier link can consist of one to three T1 or E1 carriers.

A carrier link terminates in a telco demarcation point and from the telco demarcation point, carrier links are routed to the intended telecommunications equipment. The distance between the system or Carrier Remote IPE and the first T1 or E1 repeater, the CSU, or the LTU should not exceed 200 m (655 ft). Therefore, the system and the Carrier Remote IPE should be located within 200 m from their respective telco demarcation points and the first repeater boxes. The actual distance is DIP-switch selectable on the Local and Remote Carrier Interface cards.

Note: The NT7R87AA T1 CSU Cable Kit provided with the Carrier Remote IPE equipment is used to connect the Local and Remote Carrier Interface cards to CSUs at a distance of 32 feet (9.75 m). Install this cable kit, if applicable, between the telco demarcation point (CSU) and the Local Carrier Interface card at the local site and the Remote Carrier Interface card at the remote site as a preinstallation procedure.

Route twisted pairs for T1 or E1 carrier links from the telco demarcation point to the carrier equipment. Use standard cable routing procedures to prevent cable exposure to possible damage from contact with machine and human traffic. Terminate the twisted-pair wires with 8-pin modular plug. If coaxial cables are used, they must be terminated with BNC-type connectors.

Note: For an E1 carrier system that uses coaxial cable, the impedance must be set on the Local and Remote Carrier Interface card to 75 Ohm. Refer to [Figure 9](#) and [Figure 15](#) to set SW1, SW2, SW5, and SW8 for E1 carrier impedance of 75 Ohm.

Selecting the Local Carrier Interface card slot

The position of the Local Carrier Interface card in Meridian 1 depends on the Meridian 1 system option installed at the local site. The system option determines in what type of module the card will be housed.

CAUTION

Check if the module is equipped with BTUs that protrude between card slot connectors in the network shelf. Make sure that you do not attempt to install the Local Carrier Interface card in the card slot immediately to the left of a BTU. If Network Hybrid Kit NT5D40AA is use instead of BTUs, you can install the Local Carrier Interface card into any superloop network card slot with the network hybrid.

[Table 8](#) lists modules that provide network card slots, the system options where these modules are used, and card slots where network cards can be installed. Card slots that may be physically restricted by BTUs are identified by a Note in [Table 8](#) and [Table 9](#). You can also use the right-hand superloop card slots if the slot does not have a BTU

Table 8
Meridian 1 modules supporting Local Carrier Interface cards

Modules	System option	Network card slot
NT5D21 Core/Network Module	51C, 61C, 81C	0-7
NT8D11 CE/PE Module	21E	4-9
NT8D35 Network Module	71, 81, 81C	5-10, 11&12 (Note)
NT9D11 Core/Network Module	61C	0&1 (Note), 2-7
NT6D39 CPU/Network Module	51, 61	1&2 (Note), 3-8
Note: Card slot 11 and 12 can be used with NT8D35BA and NT8D35EA vintage Network Modules or Network Modules with NT8D3507 backplane, which are equipped with network Hybrid Kit NT5D40AA instead of BTUs. In older vintage NT8D35 Network Modules, NT9D11 Core/Network Modules, and NT6D39 CPU/Network Modules, a BTU upgrade kit can be used to replace the BTUs to be able to use the card slots identified with the Note for the installation of the Local Carrier Interface card.		

The NT5D40AA Hybrids Kit includes four network hybrids require to replace two BTUs in a single network shelf or module. The kit also includes the extraction tool that must be used if a network hybrid has to be removed.

Table 9 lists NT and XT cabinet shelves that provide network card slots, the systems where these shelves are used, and card slots where network cards can be installed. You can also use the right-hand superloop card slots if the slot does not have a BTU.

Table 9
System cabinet shelves supporting Local Carrier Interface cards

System Shelf	System	Network card slot
Network shelf (QSD39)	NT, XT	3 (Note), 4-10
Network shelf (QSD40)	NT, XT	5-10, 11&12 (Note)
Note: To use 3, 11, or 12 network card slots, a BTU upgrade kit should be used. This NT5D40AA Hybrid kit replaces BTUs in the network shelf.		

Network card slots in the modules and shelves listed house other network-type cards that are contending with the Local Carrier Interface card for space in the module or shelf. If one or more network card slots are empty, the choice of where to install the Local Carrier Interface card is shown in the following section.

Note: Each network card slot supports two network loops. Although an NT8D04 Superloop Network card physically occupies only one card slot, it occupies four network loops.

Selecting the I/O Panel connector cutouts to install the Carrier I/O panel assemblies

Meridian 1 systems contain Network Modules and modules that contain network card slots among card slots for common and sometimes peripheral equipment. Each module type has a different I/O panel and may or may not have connector cutouts suitable for installation of the carrier remote panel assemblies.

Before you install the carrier panel assemblies into the I/O panel connector cutouts, you should carefully select the appropriate connector cutouts, identify their connector number, and use the Carrier Remote IPE Connection Record label below to record the installation characteristics for each Local Carrier Interface card.

Network Module I/O Panel connector cutouts selection

When installing the carrier remote panel assemblies for each Local Carrier Interface card, use the recommendations listed below:

- Use Local Carrier Interface card I/O extension cables, NT7R69AA and NT7R69BA, if it is necessary to reach available I/O panel connector cutouts in other network modules or Core/IF modules.
- When installing multiple Local Carrier Interface cards and their respective carrier panel assemblies into a Network Module, use the following recommendations for the P0745716 Universal I/O panel:
 - Left I/O Panel:
For the first Local Carrier Interface card, install the NT7R57AA Carrier Panel Assembly into the I/O panel connector cutout J22 and the NT7R58AA Maintenance Panel Assembly into the connector cutout J26.
 - Right I/O Panel:
For the second Local Carrier Interface card, install the NT7R57AA Carrier Panel Assembly into the I/O panel connector cutout J2 and the NT7R58AA Maintenance Panel Assembly into the connector cutout J6.

Carrier Remote IPE Module I/O panel connector selection

- When installing the carrier remote panel assemblies for the Remote Carrier Interface card at the rear of the IPE Module, use the recommendations listed below:
 - **Left I/O Panel:**
Install the NT7R59AA Carrier Panel Assembly into the J4 connector cutout.
Install the NT7R60AA Carrier/Alarm Panel Assembly into the J5 connector cutout.
 - **Right I/O Panel:**
Install the NT7R61AA Maintenance Panel Assembly into the J2 connector cutout.
- Locate connector cutouts that are 2.25 inches high on the I/O panel at the rear of the module containing the Local Carrier Interface card.

Note: Some old network modules have 2.00 inch connector cutouts, which are not suitable for carrier panel assembly installation. To be able to install these carrier panel assemblies, you must replace the module's I/O panels with the latest version that have 2.25 inch connector cutouts.
- Use the left-hand-side I/O panel connector cutouts for the Local Carrier Interface card carrier panel assemblies installation to avoid cable congestion on the right-hand side, if possible.
- Use side-by-side connector cutouts for the Local Carrier Interface card panel assemblies starting at the top of the I/O panel. This avoids obstruction of internal cable-way and associates the carrier panel assemblies with their respective Local Carrier Interface cards.

Note: The current left-hand I/O panel for the Network Module has the highest numbered connector position (J38) in the lower left-hand corner. Older left-hand-side I/O panels on the Network Modules have the highest numbered connector position (J28) in the lower left-hand corner.

- This older Network Module Universal I/O panel such as P075058 can accommodate only one set of carrier panel assemblies, which correspond to one Local Carrier Interface card. Side-by-side connector cutouts suitable for carrier panel assembly installation are:
 - Left I/O Panel:
For the first Local Carrier Interface card, install the NT7R57AA Carrier Panel Assembly into the I/O panel connector cutout J17 and the NT7R58AA Maintenance Panel Assembly into the connector cutout J16.
 - Right I/O Panel:
For the second Local Carrier Interface card, install the NT7R57AA Carrier Panel Assembly into the I/O panel connector cutout J2 and the NT7R58AA Maintenance Panel Assembly into the connector cutout J1.

Carrier Remote IPE connection record label

Affix this label ([Figure 8](#)) at the rear of the module housing the Local Carrier Interface card(s). Place the label at the same level as the corresponding I/O panel connector cutouts used to install its Carrier and Maintenance Panel Assemblies for that specific Local Carrier Interface card. If the label is not available, make your own and paste them on the module.

Label entries description:

Remote Site—Name of the Remote Carrier IPE site associated with this Local Carrier Interface card superloop number (SUPC)

Local Carrier Interface Superloop (SUPC)—Enter here the designated superloop number for this specific Local Carrier Interface card.

Carrier I/O Panel Connector Position—Enter the number of the selected connector cutout on the I/O panel where the Carrier Panel Assembly is installed, for example J22.

Figure 8
Carrier Remote IPE Connection Record label

Carrier Remote IPE Connection Record	
Remote Site: _____	
Local Carrier Interface Superloop (SUPC): _____	
Carrier I/O Panel Connector Position: <u>J</u> _____	
Maint. I/O Panel Connector Position: <u>J</u> _____	
Maint. Daisy-chain	Sys. Mon. Daisy-chain
P2: _____	J5: _____
P3: _____	J6: _____
Telco Circuit ID:	
C0: _____	
C1: _____	
C2: _____	

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Maint. I/O Panel Connector Position—Enter the number of the selected connector cutout on the I/O panel where the Maintenance Panel Assembly is installed, for example J26.

Maint. Daisy-chain—Enter the appropriate information for P2 and P3 connectors of the NT7R67DA Local External Maintenance Cable Assembly to identify what they are connected to. They can be connected as follows (refer to Figure 12 on page 84):

P3 can be connected to the; **MMI terminal** or to **P2 of SUPCxxx**.

P2 can be connected to the; **Host SDI port x**, or **P3 of SUPCxxx**.

where **xxx** in SUPCxxx is the superloop number of the Local Carrier Interface card in the daisy-chain.

Sys. Mon. Daisy-chain—Enter the appropriate information for J5 and J6 modular jacks to identify what they are connected to. They can be connected as follows (refer to Figure 13 on page 88):

J5 can be connected to; **J6 of Master Sys. Mon.** or to the next **slave system monitor** in the direction of the **master system monitor**, or to the next **LCI SUPCxxx J6** in the direction of the **master system monitor**.

J6 can be connected to; **J5** of the next **system monitor** in the direction away from the **master system monitor**, or to **J5** of the next **LCI SUPCxxx** in the direction away from the **master system monitor**, where **xxx** in SUPCxxx is the superloop number of the Local Carrier Interface card in the daisy-chain.

Telco Circuit ID—Enter the telco circuit ID number for each carrier link coming from the telco demarcation point.

For a collocated installation, where telco network is not used, specify the cable pairs used for each carrier link.

Meridian 1 equipment installation

To complete the installation of the T1 or E1 carrier interface that links the system to the Carrier Remote IPE equipment, you must:

- install and verify the operation of the system, if not already installed and operating correctly
- identify the network card slot and install the Local Carrier Interface card in the system
- install the faceplate cables
- connect the cable to the SDI, the system monitor, and the TTY ports
- connect the carrier link to the I/O panel assembly

Installing and verifying system operation

The Carrier Remote IPE facilities can be added to an existing Meridian 1 system running on X11 release 21 or later and carrier software REM_IPE 286 by installing the appropriate carrier equipment into the system, installing one or more Carrier Remote IPEs at different remote sites, and linking Meridian 1 with remote sites using T1 or E1 links.

To install a new Meridian 1 system, follow the instructions in *Meridian 1 system installation procedures* (553-3001-210). It describes how to install a complete Meridian 1 system.

If a new Meridian 1 system is configured with Carrier Remote IPE facilities, the system will normally be assembled at the factory with the Local Carrier Interface and the associated cards already installed and internal cables connected between the Local Carrier Interface card faceplate and the I/O panel assembly at the rear of the module housing this card. After the system is installed, you have to connect the T1 or E1 carrier links to the Meridian 1 and the Carrier Remote IPE I/O panel assembly T1 or E1 connectors. However, if the Local Carrier Interface card is not installed, follow the steps in the next section.

Installing the Local Carrier Interface card

The following steps show you how and where to install the Local Carrier Interface cards. In a new system, the card is shipped installed in a network card slot from the factory. However, you may have to install additional Local Carrier Interface cards to expand the number of remote sites or replace a defective card. The card can be installed when the system is powered up and running. [Table 12](#) lists the default (factory provided switch settings) on the Local Carrier Interface card. Verify the switch settings before installation.

To install these cards:

- 1** Set the ENB/DIS switch on the NT7R51 Local Carrier Interface card to DIS.
- 2** Set the DIP switches to specify the carrier type (T1 or E1), the distance to the first signal regenerator (repeater, CSU, or LTU), the MMI terminal baud rate, the card site (local), and the card address in a daisy-chain, as shown in [Figure 9](#). The DIP switch setting will depend on the physical system configuration. [Figure 9](#) shows that carriers are selected for T1 transmission because all the switches from SW2 through SW10 are pointing towards T1 positions. Also SW1 position 8 selects T1 or E1 in firmware.
- 3** Pull the NT7R51 Local Carrier Interface card locking devices away from the faceplate. Holding the card by these locking devices, insert it into the card guides of the selected network card slot. Make sure the card slot does not have a BTU installed in that position. Verify that there is no BTU obstructing the card slot.
- 4** Slide the card into the module until it engages in the backplane connector.

- 5 Carefully push the locking device levers toward the faceplate to insert the card connector into the backplane connector and lock the card in place.
- 6 Set the ENB/DIS switch on the NT7R51 Local Carrier Interface card to ENB and observe the card LED at the top of the faceplate as the Local Carrier Interface card performs self-tests. The card LED should blink three times and then stay on until enabled by software. When enabled by software, the card LED turns off permanently, as long as the card is operational. Refer to “LED indicators” on page 165 for more information about the Local Carrier Interface card carrier and maintenance LEDs.

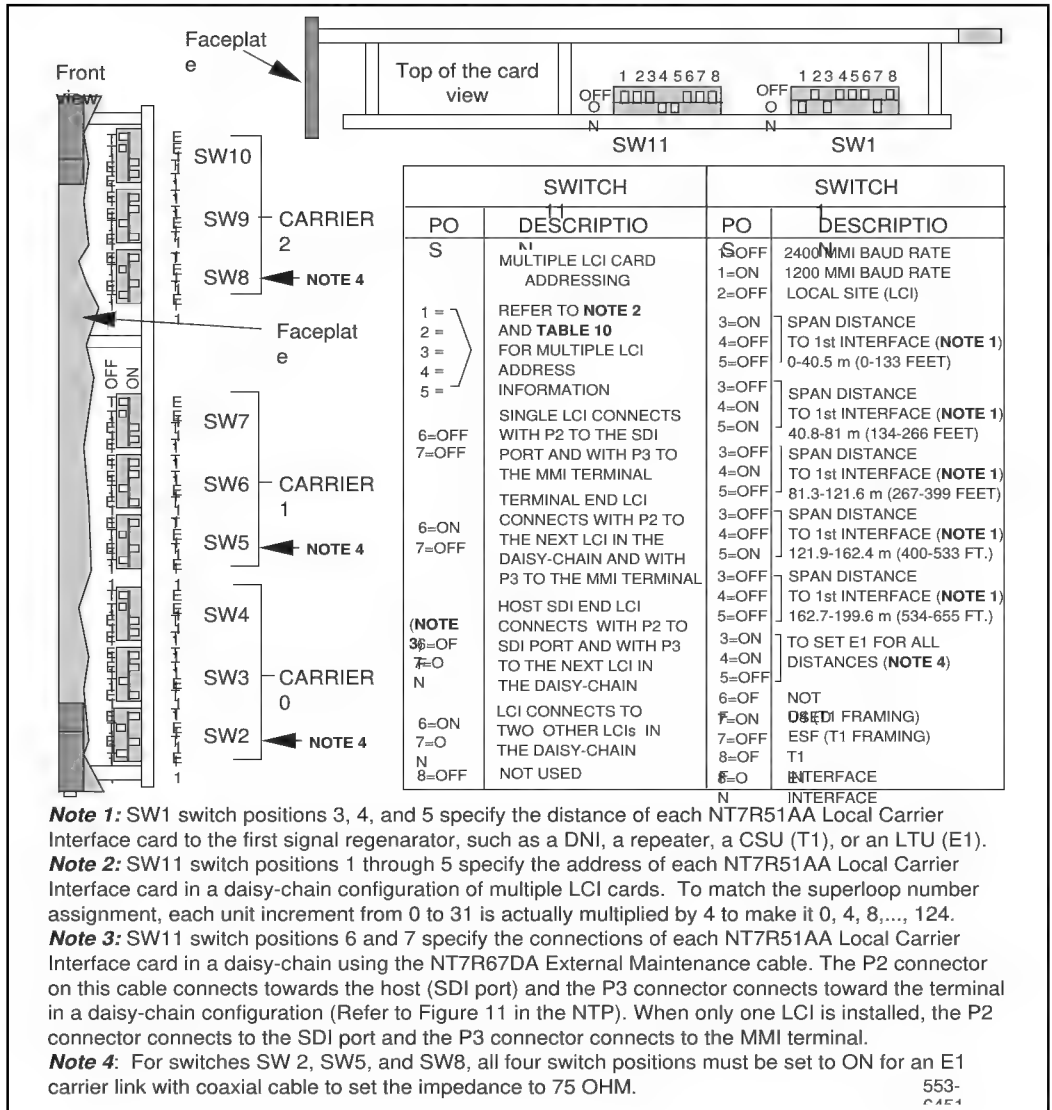
Note: When the ENB/DIS switch is switched to ENB, it also enables the carrier clocking. This allows the T1 carrier links to be tested even before the Local Carrier Interface card is software enabled.

Table 10
Local Carrier Interface standard (default) switch settings

Switch	Switch positions							
	1	2	3	4	5	6	7	8
SW1	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
SW11	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
SW2	OFF	ON	OFF	ON	-	-	-	-
SW3	ON	OFF	ON	ON	-	-	-	-
SW4	ON	ON	OFF	OFF	-	-	-	-
SW5	OFF	ON	OFF	ON	-	-	-	-
SW6	ON	OFF	ON	ON	-	-	-	-
SW7	ON	ON	OFF	OFF	-	-	-	-
SW8	OFF	ON	OFF	ON	-	-	-	-
SW9	ON	OFF	ON	ON	-	-	-	-
SW10	ON	ON	OFF	OFF	-	-	-	-

Figure 9 shows the Local Carrier Interface card DIP switches SW1 through SW11 and their functions.

Figure 9
Local Carrier Interface card DIP-switch positions and function



[Table 11](#) lists all possible addresses for an NT7R51 Local Carrier Interface card, which are selected on the card with switch SW11 switch positions 1 through 5 (refer to [Figure 9](#) for the SW11 switch position). The address is used to address a specific Local Carrier Interface card in a daisy-chain configuration.

Table 11
NT7R51 Local Carrier Interface card maintenance daisy-chain address

LCI Address	SW11 Positions 1–5 (1 = ON, 0 = OFF)				
	1 (bin 16)	2 (bin 8)	3 (bin 4)	4 (bin 2)	5 (bin 1)
0	0	0	0	0	0
4	0	0	0	0	1
8	0	0	0	1	0
12	0	0	0	1	1
16	0	0	1	0	0
20	0	0	1	0	1
24	0	0	1	1	0
28	0	0	1	1	1
32	0	1	0	0	0
36	0	1	0	0	1
40	0	1	0	1	0
44	0	1	0	1	1
48	0	1	1	0	0
52	0	1	1	0	1
56	0	1	1	1	0
60	0	1	1	1	1
64	1	0	0	0	0
68	1	0	0	0	1
72	1	0	0	1	0
76	1	0	0	1	1
80	1	0	1	0	0
84	1	0	1	0	1
88	1	0	1	1	0
92	1	0	1	1	1
96	1	1	0	0	0
100	1	1	0	0	1
104	1	1	0	1	0
108	1	1	0	1	1
112	1	1	1	0	0
116	1	1	1	0	1
120	1	1	1	1	0
124	1	1	1	1	1

Note: For SUPC 0-124 the Local Carrier Interface card MMI address (SW 11, POS 1-5) should match the superloop number. For SUPC 128-156, where the Local Carrier Interface card is installed in Network Group 4, the Local Carrier Interface card address cannot match the superloop number but the address must be unique within the MMI maintenance daisy-chain. Document on the LCI Connection Record card any Local Carrier Interface card MMI address that does not match the SUPC superloop number.

Installing the Local Carrier Interface cable assemblies

The Local Carrier Interface card has two connectors located on the faceplate. These connectors provide:

- connection to the NT7R58AA Maintenance Panel assembly for daisy-chaining the Local Carrier Interface cards and the system monitor
- connection to the NT7R57AA Carrier Panel assembly for the carrier links

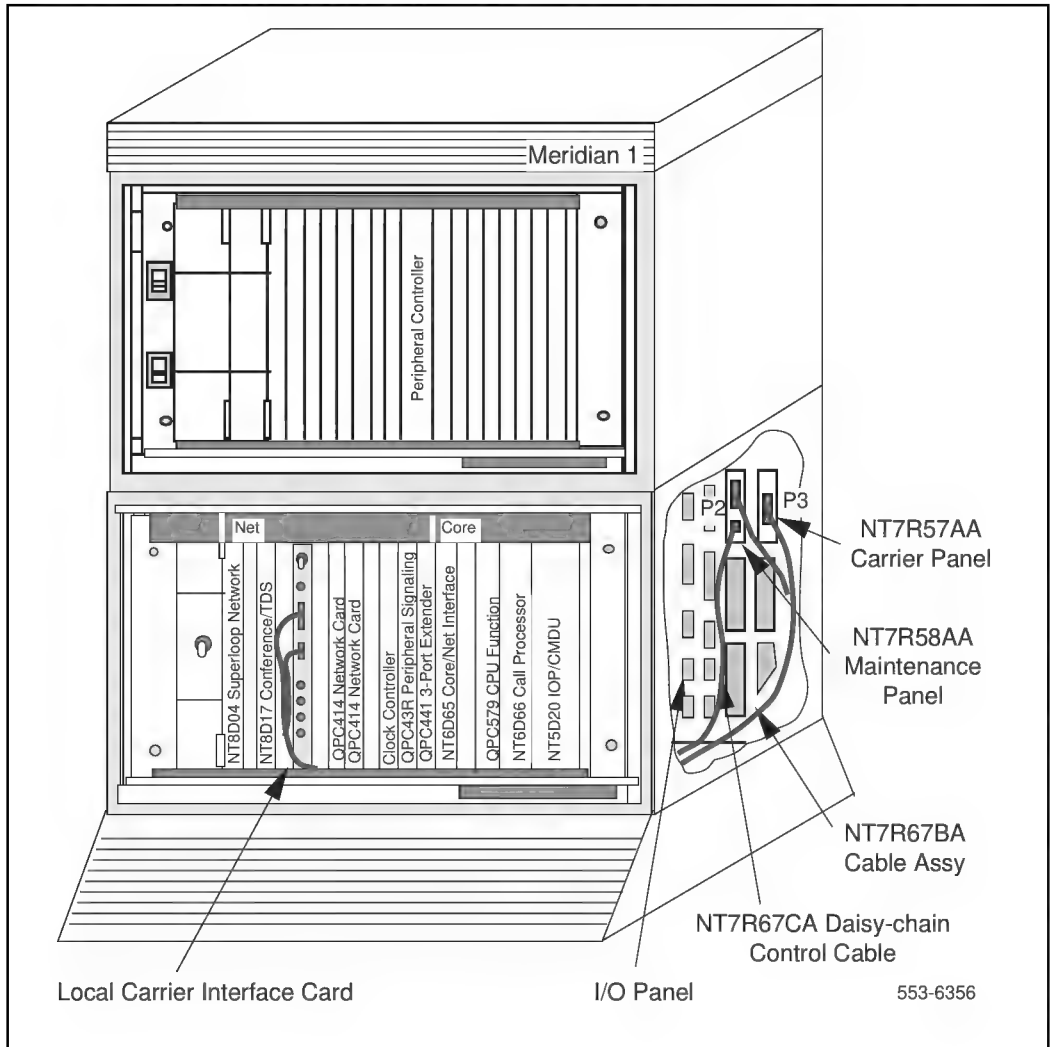
A DB-9 female connector on the faceplate of the NT7R51 Local Carrier Interface card connects to the NT7R58AA Maintenance Panel when more than one Local Carrier Interface card is equipped in the system. This allows daisy-chaining of these Local Carrier Interface cards to provide access to any of the Local Carrier Interface cards using the local MMI terminal at Meridian 1 SDI port as Host.

A DB-25 connector on the Local Carrier Interface card faceplate connects the Local Carrier Interface card to the NT7R57AA Carrier Panel assembly for connection to the local system monitor and the carrier links. The carrier connectors on the NT7R57AA Carrier Panel assembly are 8-pin modular jacks, which connect directly to the carrier link 8-pin modular plugs. It also connects to the NT7R58AA Maintenance Panel assembly to provide the SDI port and the MMI terminal connections. If an E1 carrier link is a coaxial cable terminated with BNC connectors, the NT7R67EA Coaxial Interface Adapter cable (8-pin modular plug to BNC) is used to connect the 8-pin modular jacks at the NT7R57AA Carrier Panel assembly to the BNC carrier link connectors. Also refer to [Figure 9](#) and [Figure 15](#) to set SW1, SW2, SW5, and SW8 for E1 operation and carrier impedance of 75 Ohm.

Note: For multiple Local Carrier Interface cards connected in a daisy-chain, it may not always be possible to find empty network card slots and or suitable I/O panel connector cutouts to accommodate two or more Local Carrier Interface cards. In that case, you may have to use suitable network card slots in a different module or column. If the cable assemblies are not long enough to span between the faceplates and the I/O panels, you may have to use extension cables that are used for this purpose in the NT and XT systems. Refer to Figure 14 “Local Carrier Interface card faceplate cable connections in NT or XT system” on page 93.

Figure 10 shows a Meridian 1 option 51C example with the Local Carrier Interface card and faceplate cable already installed to the NT7R57AA Carrier and NT7R58AA Maintenance Panel assemblies.

Figure 10
Local Carrier Interface card faceplate cable connections in Meridian 1



Installing the NT7R67BA Local Carrier/Monitor Cable Assembly into a module

Before you can plug the NT7R67BA Local Carrier/Monitor Cable Assembly P1 connector into the faceplate DB-25 female connector, install the NT7R57AA Carrier Panel and the NT7R58AA Maintenance Panel assemblies. These assemblies are installed into the empty connector slots on the I/O panel at the rear of the network module where the NT7R51 Local Carrier Interface card(s) is installed. Refer to [“Network Module I/O Panel connector cutouts selection” on page 62](#) recommendations.

Note: The NT7R57AA Carrier and the NT7R58AA Maintenance Panel assemblies together with the NT7R67HA cable are integral parts of the NT7R67BA Local Carrier/Monitor Cable Assembly. To assists you in connecting the cable assemblies, refer to Appendix C, [Figure 27](#).

To install the NT7R57AA Carrier and the NT7R58AA Maintenance Panel assemblies and to plug the cable P1 connector into the faceplate connector:

- 1** Remove the back panel at the rear of the module to access the I/O panel connector slots and later to route the NT7R67HA cable P1 connector to the front of the module.
- 2** Identify a pair of empty connector cutouts that are the appropriate size for the panel assemblies mounting holes. These cutouts must be vertically or horizontally adjacent on the same I/O panel.
- 3** From the rear of the module, route the DB-25 female P1 connector of the NT7R67BA cable assembly through the module’s cable channel to the front of the module and ensure that the cable connectors with attached panel assemblies remain at the rear of the module next to the module’s I/O panel connector cutouts.
- 4** Install the NT7R57AA Carrier Panel assembly already connected to the P3 DB-15 HD female connector of the NT7R67BA cable assembly. Mount it into the selected I/O panel connector cutout so that the 8-pin modular jack tabs are to the left. Refer to Figure 11 “System monitor, local MMI terminal, and carrier links cable connections” on page 77 for connector orientation. Fasten the panel to the cutout by using the screw at the top of the cutout.

- 5 Install the NT7R58AA Maintenance Panel assembly already connected to the P2 DB-15 HD male connector of the NT7R67BA cable assembly. Mount it into the selected I/O panel connector cutout by using the screw at the top of the cutout.
- 6 Plug the DB-25 male P1 connector of the NT7R67BA cable assembly into the DB-25 female connector located on the faceplate of the NT7R51 Local Carrier Interface card.

Installing the NT7R67CA Local daisy-chain cable

This cable is installed only when multiple NT7R51 Local Carrier Interface cards are equipped and are connected in a daisy-chain. The daisy-chain configuration provides an easy access to each Local Carrier Interface card from the local MMI terminal and allows the remote MMI terminal access to the Meridian 1 SDI port as host. To install this cable between the Local Carrier Interface card and the NT7R58AA Maintenance Panel, refer to Appendix C, [Figure 28](#) and follow these steps:

- 1 Pull the NT7R67CA Daisy-chain Cable assembly P1 connector through the cable channel to the front of the module.
- 2 Plug the DB-9 male P1 connector of the NT7R67CA cable assembly into the DB-9 female connector located on the faceplate of the Local Carrier Interface card.
- 3 Plug the DB-9 male P2 connector at the other end of the NT7R67CA cable assembly into the DB-9 female connector on the NT7R58AA Maintenance Panel.

Installing SDI and local MMI terminal cables

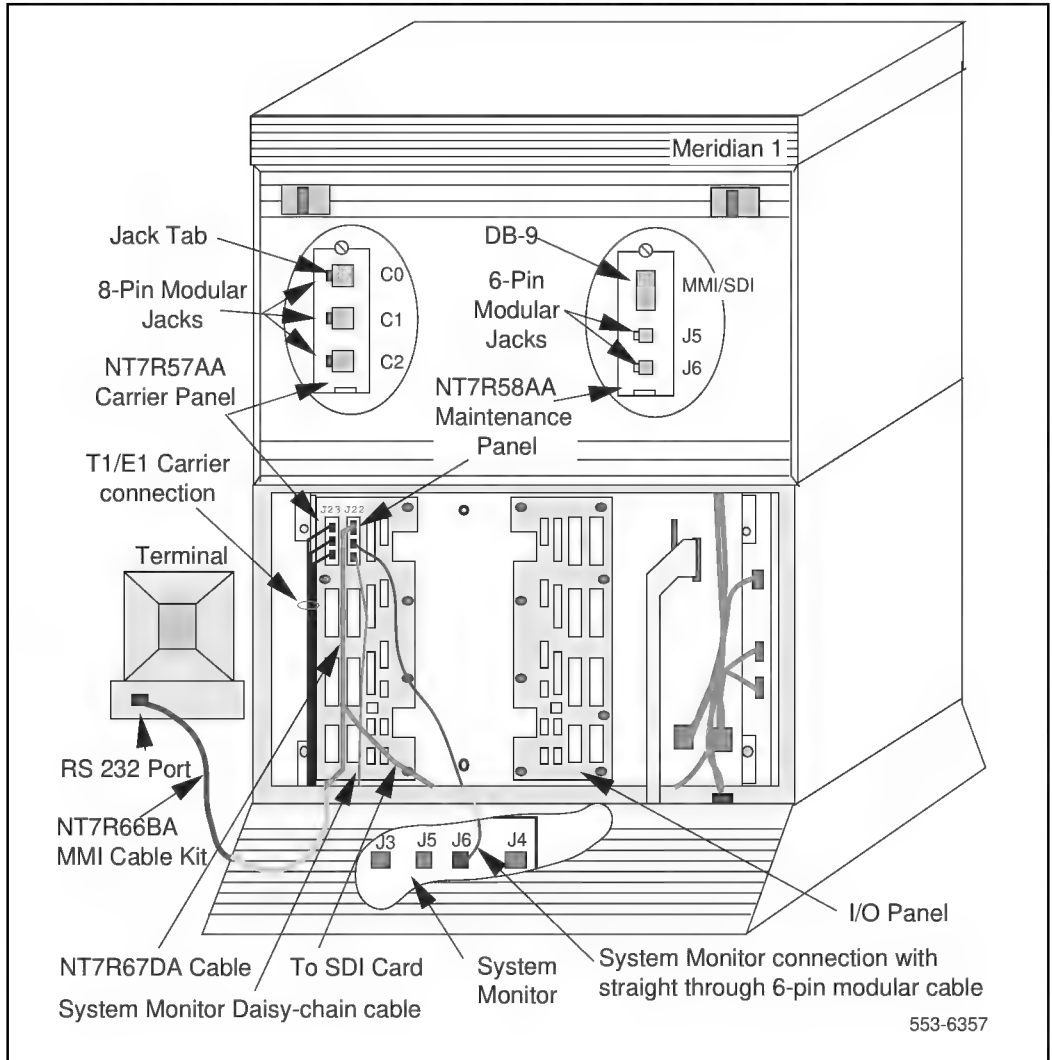
The NT7R67DA External Maintenance Cable Assembly connects the SDI card and the TTY terminal to the DB-9 connector on the NT7R58AA Maintenance Panel assembly located at the rear of the module that houses the NT7R51 Local Carrier Interface card.

For a single Local Carrier Interface card equipped in the Meridian 1 system the P3 DB-9 male DCE connector on the NT7R67DA cable assembly is used to connect to the local MMI terminal and the P2 DB-9 female DTE connector is used to connect to an SDI port on an SDI card, which allows the MMI terminal to access the Meridian 1 system as a host. Refer to [Figure 11](#) and Appendix C, [Figure 27](#).

For multiple Local Carrier Interface cards, refer to Figure 12 on page 84 and Appendix C, [Figure 28](#) that shows how to connect multiple Local Carrier Interface cards to multiple I/O panel assemblies to provide MMI and SDI connections for all Local Carrier Interface cards. To facilitate equipment maintenance, follow the same order as for the system monitor daisy-chain in descending order from the MMI terminal to the SDI port.

Figure 11 shows the NT7R57AA Carrier Panel and NT7R58AA Maintenance Panel assemblies with the system monitor, the SDI/TTY, and the carrier connections. The NT7R58AA Maintenance panel assembly connector is used to connect the SDI port and the local MMI terminal. The NT7R57AA Carrier panel assembly is used to connect the three carriers.

Figure 11
System monitor, local MMI terminal, and carrier links cable connections



Connecting a single Local Carrier Interface card to the MMI terminal

- 1** To connect a single NT7R51 Local Carrier Interface card to the MMI terminal:

Note: Appendix C provides connection diagrams ([Figure 27](#)) and pin assignment information for all external connectors that connect to the SDI port, the MMI terminal, the system monitor card, the external alarms, and the carrier links.

- Plug the DB-9 male P1 connector at the common end of the NT7R67DA Local External Maintenance Cable assembly into the DB-9 female connector on the NT7R58AA Maintenance Panel assembly.
- Plug the DB-9 male P3 connector of the NT7R67DA cable assembly into the DB-9 female connector of the NT7R66BA MMI Cable.
- Plug the DB-25 male end of the NT7R66BA MMI Cable into the MMI terminal RS-232 connector. If you have to change the gender at the terminal, use the appropriate compact gender changer.
- To connect P3 DB-9 male connector of the NT7R67DA Local External Maintenance Cable directly to the DB-9 male RS-232 serial communication port of a laptop computer, use a NT7R66BA MMI Cable and the appropriate compact adapter.

2 MMI terminal connection using a modem:

- If you need a modem to connect a distant MMI terminal to the MMI port on the Meridian 1 I/O panel, plug the DB-9 female connector of the NT7R66BA MMI Cable into the P3 DB-9 male connector of the NT7R67DA cable.
- Plug the DB-25 male connector of the NT7R66BA MMI Cable into a DB-25F/DB-25M nullmodem.
- Connect the nullmodem DB-25 male connector to the modem DB-25 female connector. Use the appropriate gender changer, if required.

3 MMI terminal connection using an A/B switch box:

- Connect the P3 of the NT7R67DA Local External Maintenance Cable assembly DB-9 male connector into the DB-9 female connector of the NT7R66BA MMI Cable.
- Plug the DB-25 male and of the NT7R66BA MMI Cable into the A/B switch box DB-25 female C connector.
- From the switch box, you can connect a local MMI terminal directly to the A position on the switch box using a standard DB-25M/DB-25M straight-through cable.
- You can also connect a distant MMI terminal over a standard DB-25M/DB-25M straight-through cable, a nullmodem, and a modem to the switch box B position.

4 Terminal/Modem connections over the MSDL Single Terminal Access:

- To avoid using the A/B switch box, you can use three ports on the MSDL card.
- Connect one MSDL port to the Meridian 1 local MMI terminal
- Connect the second MSDL port to a modem.

- Connect the third MSDL port to the P3 DB-9 male connector of the NT7R67DA Local External Maintenance Cable assembly by using the NT7R66BA MMI Cable.

Connecting a single Local Carrier Interface card to the SDI card

Refer to Appendix C and [Figure 27](#) to see the SDI connection diagram.

1 To connect a single NT7R51 Local Carrier Interface card to the QPC 841 or other SDI cards:

- Route the DB-9 female P2 connector of the NT7R67DA cable assembly to an available SDI port on an SDI card.
- Plug the DB-9 male connector of the NT8D93AJ XSDI I/O cable into the DB-9 female SDI connector on the I/O panel.
- Plug the DB-25 male connector of the NT8D93AJ XSDI I/O cable into the DB-25 female connector on the NT7R66AA SDI Cable Kit.
- Plug the DB-9 male connector of the NT7R66AA SDI Cable Kit into the DB-9 female connector into the NT7R67DA cable P2 connector.

2 To connect other SDI cards:

- Route and install the DB-9 female P2 connector of the NT7R67DA cable assembly to an available SDI port on an SDI card.
- Plug the DB-25 male connector of the NT7R66AA SDI Cable Kit to connect the DB-25 female SDI connector at the I/O panel. (The DB-25F/DB-25F adapter is not used).
- Plug the DB-9 male connector on the NT7R66AA SDI Cable Kit into the P2 connector on the NT7R67DA cable.

To test the MMI and Host SDI login, refer to “MMI mode” on page 139 and “Host SDI mode” on page 141 for login instructions.

Note: For additional information about types of SDI cards, their SDI ports, and special cables required to connect these ports, refer to *Meridian 1 serial data interface cards description* (553-3001-107).

Connecting multiple Local Carrier Interface cards to the MMI terminal

Make sure that all the NT7R51 Local Carrier Interface cards are properly configured for the daisy-chain card addressing as shown in Figure 9 “Local Carrier Interface card DIP-switch positions and function” on page 69 and Appendix C, [Figure 28](#).

Note: For maintenance convenience, use the daisy-chain addressing in descending order from the MMI terminal side to the host SDI side.

Make sure the NT7R67CA Local Daisy-chain Cable Assembly is installed for all Local Carrier Interface cards in the daisy-chain. Refer to “Installing the NT7R67CA Local daisy-chain cable” on page 75.

- 1** To connect multiple NT7R51 Local Carrier Interface cards in a daisy-chain configuration and to the MMI terminal, connect the cables as shown in [Figure 12](#) and Appendix C, [Figure 28](#):
 - Plug the DB-9 male P1 connector at the common end of the NT7R67DA cable into the DB-9 female connector on the NT7R58AA Maintenance Panel assembly that corresponds to Local Carrier Interface card #1.
 - Install the NT7R67DA cable assembly #2, as in step 1, for the Local Carrier Interface card #2.
 - Connect the DB-9 male P3 connector from the cable in position #1 with the DB-9 female P2 connector of the NT7R67DA cable assembly in position #2.
 - Install the NT7R67DA cable assembly #3, as in step 1, for the Local Carrier Interface card #3.
 - Connect the DB-9 male P3 connector from the cable in position #2 with the DB-9 female P2 connector of the NT7R67DA cable assembly in position #3.
 - Plug the DB-9 male P3 connector of the NT7R67DA cable assembly in position #3 into the DB-9 female connector of the NT7R66BA MMI Cable.

- Plug the DB-25 male end of the NT7R66BA MMI Cable into the DB-25 female connector of the MMI terminal RS-232 connector. If you have to change the gender at the terminal, use the appropriate compact gender changer.

2 MMI terminal connection using a modem:

- If you need a modem to connect a distant MMI terminal to the MMI port on the Meridian 1 I/O panel, plug the DB-9 female connector of the NT7R66BA MMI Cable into the P3 DB-9 male connector of the NT7R67DA cable.
- Plug the DB-25 male end of the NT7R66BA MMI Cable into a DB-25F/DB-25M nullmodem.
- Connect the nullmodem DB-25 male connector to the modem DB-25 female connector.

3 MMI terminal connection using an A/B switch box:

- Connect the P3 of the NT7R67DA Local External Maintenance Cable assembly DB-9 male connector into the DB-9 female connector of the NT7R66BA MMI Cable.
- Plug the DB-25 male end of the NT7R66BA MMI Cable into the A/B switch box DB-25 female C connector.
- From the switch box, you can connect a local MMI terminal directly to the A position on the switch box using a standard DB-25M/DB-25M straight-through cable.
- You can also connect a distant MMI terminal over a standard DB-25M/DB-25M straight-through cable, a nullmodem, and a modem to the switch box B position.

4 Terminal/Modem connections over the MSDL Single Terminal Access:

- To avoid using the A/B switch box, you can use three ports on the MSDL card.
- Connect one MSDL port to the Meridian 1 local MMI terminal.
- Connect the second MSDL port to a modem.

- Connect the third MSDL port to the P3 DB-9 male connector of the NT7R67DA Local External Maintenance Cable assembly by using the NT7R66BA MMI Cable.

Connecting multiple Local Carrier Interface cards to the SDI card

Refer to Appendix C, [Figure 28](#) to see the SDI connection diagram.

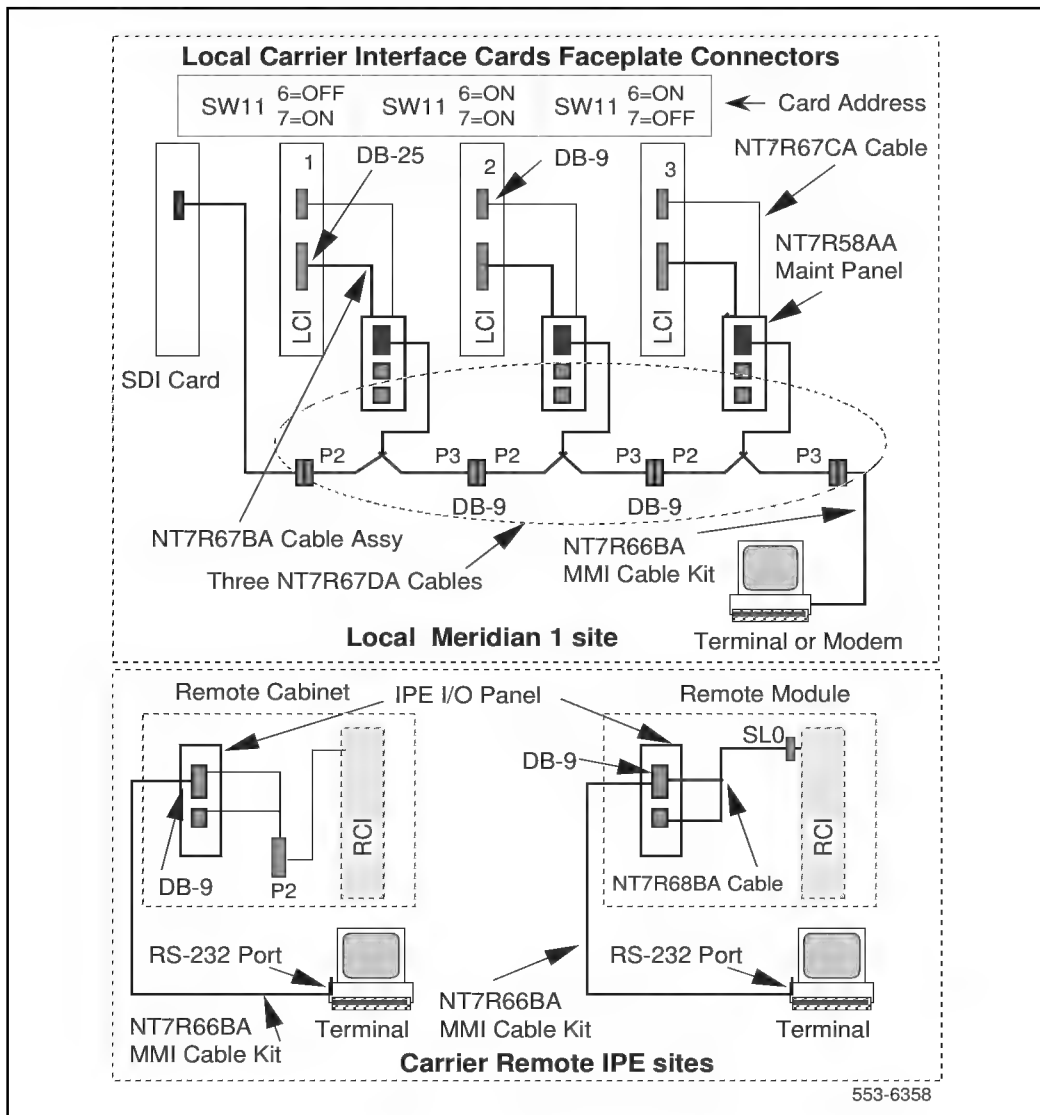
- 1 To connect a single NT7R51 Local Carrier Interface card to the QPC 841 or other SDI cards:
 - Route the DB-9 female P2 connector of the NT7R67DA cable assembly of the Local Carrier Interface card #1 to an available SDI port on an SDI card.
 - Plug the DB-9 male connector of the NT8D93AJ XSDI I/O cable into the DB-9 female SDI connector on the I/O panel.
 - Plug the DB-25 male connector of the NT8D93AJ XSDI I/O cable into the DB-25 female connector on the NT7R66AA SDI Cable Kit.
 - Plug the DB-9 male connector of the NT7R66AA SDI Cable Kit into the DB-9 female connector into the NT7R67DA cable P2 connector.
- 2 To connect other SDI cards:
 - Route and install the DB-9 female P2 connector of the NT7R67DA cable assembly of the Local Carrier Interface card #1 to an available SDI port on an SDI card.
 - Plug the DB-25 male connector of the NT7R66AA SDI Cable Kit to connect the DB-25 female SDI connector at the I/O panel. (The DB-25F/DB-25F adapter is not used).
 - Plug the DB-9 male connector on the NT7R66AA SDI Cable Kit into the P2 connector on the NT7R67DA cable.
- 3 Secure cables with tie-wraps as appropriate.

To test the MMI and Host SDI login, refer to “MMI mode” on page 139 and “Host SDI mode” on page 141 for login instructions.

Note: For additional information about types of SDI cards, their SDI ports, and special cables required to connect these ports, refer to *Meridian 1 serial data interface cards description* (553-3001-107).

Figure 12 shows daisy-chaining of multiple Local Carrier Interface cards to allow sharing of an SDI port and a terminal or TTY.

Figure 12
Daisy-chaining multiple Local Carrier Interface cards



Connecting the system monitor cables

The NT7R58AA Maintenance Panel assembly provides two 6-pin modular jacks to connect to the system monitor located in the pedestal and one DB-9 SDI/TTY connector. The 6-pin modular jack J5 is used to connect to the system monitor J6 jack in the pedestal, as shown in [Figure 11](#), and the J6 jack on the NT7R58AA Maintenance Panel is used to connect to a slave system monitor daisy-chain as shown in [Figure 12](#).

In the local Meridian 1 column, the pedestal contains a master system monitor that monitors system alarms. Alarms from a Carrier Remote IPE site are reported over the carrier link and the Local Carrier Interface card to the Meridian 1 master system monitor and from there to the CPU. The CPU sends alarm messages to the system terminal or TTY identifying the problem.

Connecting a single Local Carrier Interface card to the system monitor

To connect the system monitor cable from the NT7R58AA Maintenance Panel assembly to the system monitor in the same column, refer to [Figure 11](#), Appendix C, [Figure 31](#), and perform these steps:

- 1 Verify existing system monitor daisy-chain first by executing the **STAT XSM** command in LD 37.
- 2 Determine the system monitor addresses for new Carrier Remote IPE column or wall-mount cabinet.
- 3 Set master system monitor slave polling address range to cover the new system monitor addresses.
- 4 Set the Remote Carrier Interface card (SW11 positions 1-5) for the new system monitor address.
- 5 Connect the system monitor daisy-chain to include new Local Carrier Interface cards by following instructions in steps 6 and 7.
- 6 Plug the 6-pin modular plug at one end of the NT8D46AL cable into the 6-pin modular jack J5 on the NT7R58AA Maintenance Panel assembly to provide an RS-422 interface to the system monitor.
- 7 Plug the other end of the NT8D46AL cable 6-pin modular plug into the J6 jack on the next system monitor in the direction of the master system monitor.

- 8 Plug the next NT8D46AL cable jack into the J6 of the NT7R58AA Maintenance Panel assembly.
- 9 Plug the other jack of the NT8D46AL cable into the J5 of the next slave system monitor in the direction away from the master system monitor.
- 10 Test the system monitor daisy-chain by executing the STAT XSM command in LD 37 and ensure that every local and remote system monitor responds to the master system monitor after the remote site is properly installed and configured.

Note: If Meridian 1 with the Carrier Remote IPE is shipped to a site, steps 6 and 7 are completed in the factory.

Connecting multiple Local Carrier Interface cards to the system monitor

Connect the Local Carrier Interface cards for system monitor daisy-chain in the same sequence as you daisy-chained the maintenance cables for the local MMI terminal and the Meridian 1 host SDI access for multiple Local Carrier Interface cards.

To daisy-chain the system monitor cables to multiple columns and multiple NT7R51 Local Carrier Interface cards, refer to [Figure 13](#), Appendix C, [Figure 31](#), and perform these steps:

- 1 Starting from the top of [Figure 13](#), plug the NT8D46AL cable 6-pin modular plug from one NT7R58AA Maintenance Panel assembly 6-pin modular jack J6 into the 6-pin modular jack J5 on the next NT7R58AA Maintenance Panel assembly.

Note: Each NT7R58AA Maintenance Panel assembly belongs to a different NT7R51 Local Carrier Interface card.

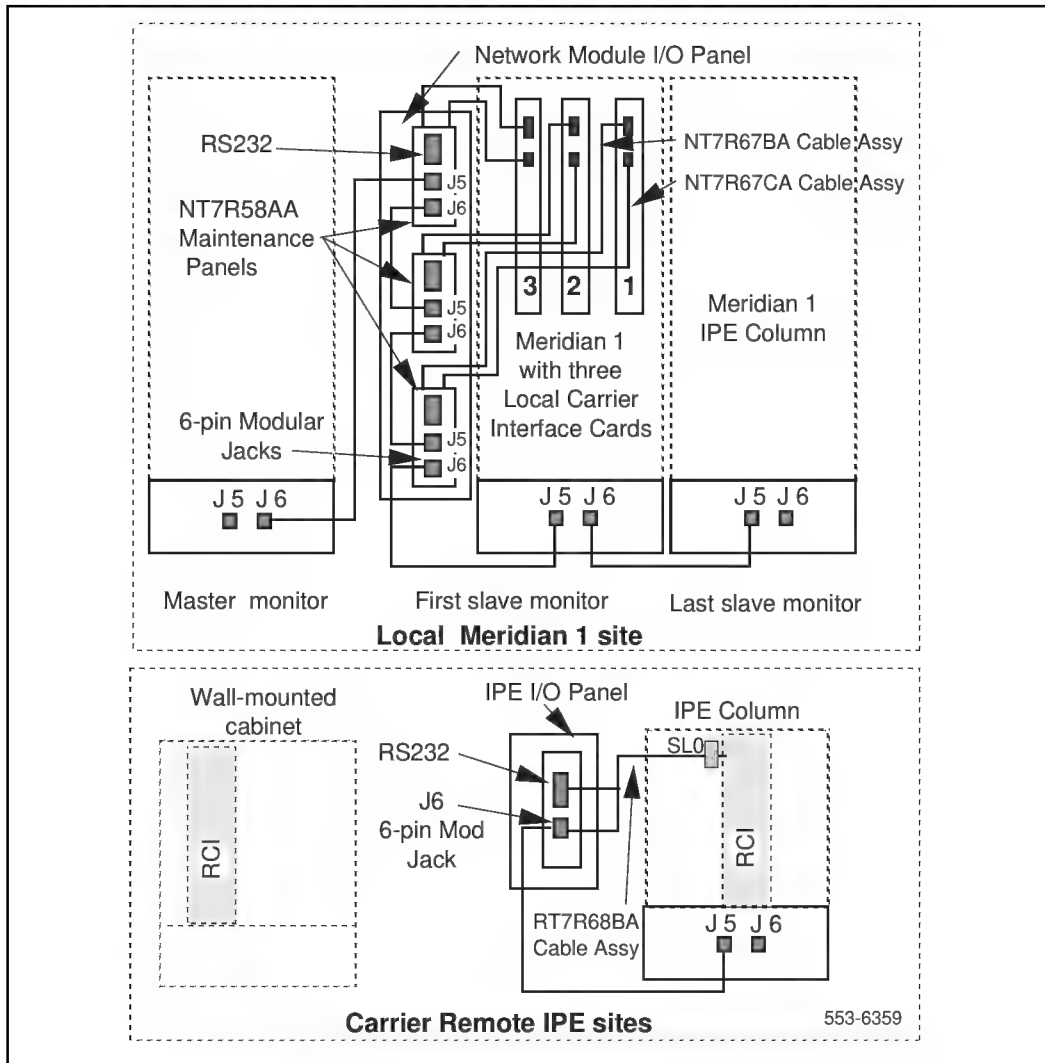
- 2 Repeat step 1 for all NT7R58AA Maintenance Panel assemblies.
- 3 Connect J5 modular jack of the top NT7R58AA Maintenance Panel assembly in [Figure 13](#) to J6 modular jack of the next system monitor towards master system monitor using the NT8D46AL modular cable.

- 4 Connect J6 modular jack in the bottom NT7R58AA Maintenance Panel assembly to the J5 modular jack of the next slave system monitor away from the master system monitor using the NT8D46AL cable.
- 5 Connect J6 modular jack of the slave system monitor to the J5 modular jack of the next slave system monitor outbound (away) from the master system monitor using the NT8D46AL cable.

Note: The columns do not have to be daisy-chained in the sequence according to the system monitor address. The system monitor daisy-chain is broken when a Local Carrier Interface card is unplugged from the network card slot. This will cause PWR error messages for polling failure on all slave system monitors that follow the removed Local Carrier Interface card in the chain. If possible, Local Carrier Interface cards should be connected at the end of the system monitor daisy-chain after all the local slave system monitors.

Figure 13 shows system monitor daisy-chain connections at Meridian 1 and Carrier Remote IPE sites. The alarm information is sent over the carrier link from the Remote Carrier IPE to the Meridian 1 CPU.

Figure 13
System monitor connections at Meridian 1 and the Carrier Remote IPE



Connecting the carrier link to the Meridian 1

T1 or E1 carrier links are connected to the NT7R57AA Carrier Panel assembly connectors at the rear of the module housing the Local Carrier Interface card. Carrier links are routed from the telco demarcation point to the Meridian 1 column for connection to the NT7R57AA Carrier Panel assembly containing three 8-pin modular jacks, as shown in Figure 11 on page 77.

Note 1: Before connecting the carrier link to the system, the connection between the telco demarcation point such as CSU, should have been completed using the NT7R87AA T1 CSU Cable Kit.

Note 2: To connect an E1 carrier terminated with BNC connectors, use the NT7R67EA Coaxial Interface Adapter Cable to connect the 8-pin modular jacks at the I/O panel to the BNC connector on each E1 carrier link coming from the telco demarcation point. Also refer to [Figure 9](#) and [Figure 15](#) to set SW1, SW2, SW5, and SW8 for E1 operation and carrier impedance of 75 Ohm.

To connect the carrier link to the network I/O panel at the local Meridian 1 site:

- 1 Route carrier links to the rear of the Meridian 1 column housing the Local Carrier Interface card.
- 2 Identify carrier 0, 1, and 2 connectors and the corresponding NT7R57AA Carrier Panel assembly connectors.
- 3 Plug each carrier cable 8-pin modular plug into the corresponding NT7R57AA Carrier Panel assembly 8-pin modular jack for each T1 carrier link.
- 4 Record the telco carrier circuit ID for each carrier link (link 0, 1, and 2).

Note: These carrier circuit IDs will be used at the remote site to identify the links that corresponds to carrier 0, 1, and 2 at the local site. This will prevent mismatch of carrier links between the Local Carrier Interface card and the Remote Carrier Interface card. Enter the carrier connection information into the Carrier Remote IPE Connection Record label, refer to Figure 8 on page 65.

- 5 If an E1 coaxial carrier link is terminated with BNC connectors, use one NT7R67EA Coaxial Interface Adapter cable to connect each 8-pin modular jack on the NT7R57AA Carrier Panel assembly to BNC carrier link connectors.
- 6 If the NT7R67EA Coaxial Interface Adapter cable is used for each E1 carrier link, identify BNC connectors on each Adapter cable that correspond to the appropriate carrier (carrier 0, carrier 1, and carrier 2) at the NT7R57AA Carrier Panel Assembly 8-pin jack.
- 7 Connect each NT7R67EA Coaxial Interface Adapter BNC connector to the appropriate BNC connector on the carrier link.
- 8 Secure the carrier link cables with tie-wraps as appropriate.

Carrier installation into NT and XT systems

To complete the installation of the T1 or E1 carrier interface that links an NT or XT system to the Carrier Remote IPE equipment, you must:

- verify the operation of the system
- make sure the system is Meridian 1 ready
- identify the network card slot and install the Local Carrier Interface card in the system shelf
- install the faceplate cables
- connect the cable to the Meridian 1 host SDI and the MMI terminal ports
- connect the carrier link to the NT7R57AA Carrier Panel assembly

Note: If NT and XT systems have been upgraded using Meridian 1 column, you can use the system monitor in the pedestal to process system alarms received from the Carrier Remote IPE site. Without the system monitor in the pedestal, the system alarms from the Carrier Remote IPE site cannot be processed.

Installing carrier equipment and verifying system operation

The Carrier Remote IPE facilities can be added to existing NT and XT systems running on X11 release 21 or later. This requires installing the appropriate carrier equipment into the system, installing one or more Carrier Remote IPEs at different remote sites, and linking the system with remote sites using T1 or E1 carriers.

The NT and XT systems have been previously installed and are normally operational. These systems must be Meridian 1 ready and must be operating correctly before they can be equipped with the Carrier Remote IPE feature. To upgrade these systems to X11 release 21 or higher, refer to *Upgrade system installation* (553-3001-250).

Installing the Local Carrier Interface card

The following steps show you how and where to install the NT7R51 Local Carrier Interface cards. The card can be installed when the system is powered up and running.

To install these cards:

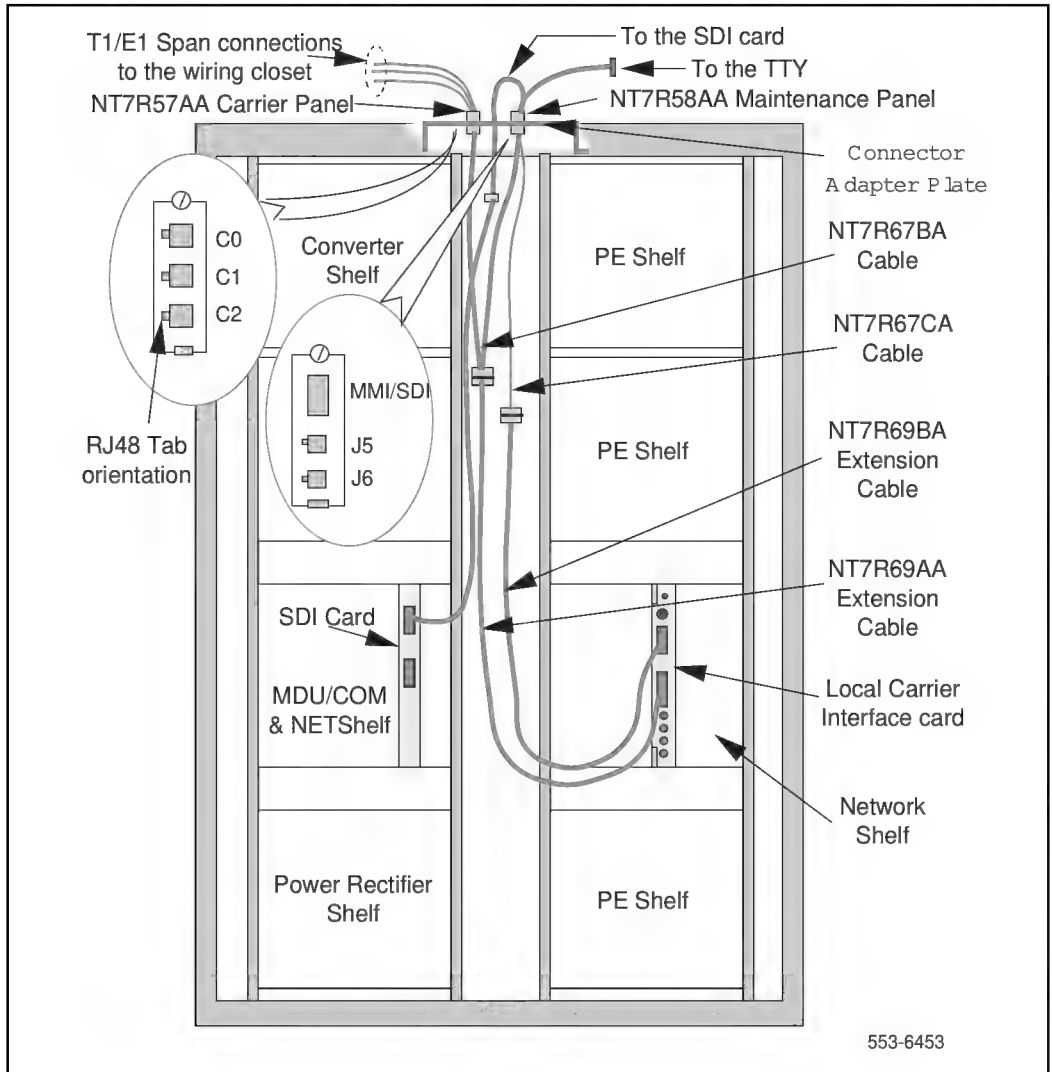
- 1 Set the ENB/DIS switch on the NT7R51 Local Carrier Interface card to DIS.
- 2 Set the DIP switches to specify the carrier type (T1 or E1), the distance to the first repeater/CSU/LTU, the terminal baud rate, the SDI/MMI terminal connection state, and addressing of multiple Local Carrier Interface cards, as shown in Figure 9 on page 69.

Note: The DIP switch setting will depend on the system configuration. [Figure 9](#) shows that carriers are selected for T1 transmission because all the switches from SW 2 through SW10 are pointing towards T1 positions.

- 3 Pull the Local Carrier Interface card locking devices away from the faceplate. Holding the card by these locking devices, insert it into the card guides of the selected network card slot. Refer to [Table 9](#).
- 4 Slide the card into the shelf until it engages the backplane connector.
- 5 Carefully push the locking device levers toward the faceplate to insert the card connector into the backplane connector and lock the card in place.
- 6 Set the ENB/DIS switch on the Local Carrier Interface card to ENB and observe the LED on the card as it performs self-tests. The LED should blink three times and then stay on until enabled by software. When enabled by software, the LED turns off permanently, if operational. You do not have to enable the card until all the hardware is installed.

Figure 14 shows an NT/XT system with the NT7R51 Local Carrier Interface card and faceplate cables already installed to the NT7R57AA Carrier Panel and NT7R58AA Maintenance Panel assemblies at the top of the cabinet.

Figure 14
Local Carrier Interface card faceplate cable connections in NT or XT system



Installing Local Carrier Interface faceplate cables

The Local Carrier Interface card has two connectors located on the faceplate. These connectors provide:

- connection to the NT7R58AA Maintenance Panel assembly for the MMI terminal and the SDI ports
- connection to the NT7R57AA Carrier Panel assembly for the carrier link

A DB-9 connector on the Local Carrier Interface card faceplate connects to the NT7R58AA Maintenance Panel assembly for connection to the local MMI terminal and the SDI ports. From the Maintenance Panel assembly DB-9 female connector, you can connect to the MMI port for the TTY connection and to an SDI port of an SDI card, or you can daisy-chain to other Local Carrier Interface card SDI connectors, as shown in Figure 12 on page 84.

A DB-25 connector on the Local Carrier Interface card faceplate connects the Local Carrier Interface card to the NT7R58AA Maintenance Panel assembly and the NT7R57AA Carrier Panel assembly. The Carrier Panel assembly uses 8-pin modular jacks to connect to the T1 or E1 carrier links.

Installing the NT7R67BA Local Carrier/Monitor Cable Assembly in a cabinet

Before you can connect the NT7R67BA Local Carrier/Monitor Cable Assembly to the NT7R51 Local Carrier Interface card, install the NT7R57AA Carrier Panel and the NT7R58AA Maintenance Panel assemblies. These panel assemblies are installed into the empty connector slots on the I/O panel at the top of the cabinet.

Note: The NT7R57AA Carrier Panel and the NT7R58AA Maintenance Panel assemblies together with the NT7R67HA cable are integral parts of the NT7R67BA Local Carrier/Monitor Cable Assembly.

- 1 Identify the empty connector cutouts at the top center of the cabinet to be used for the NT7R57AA Carrier Panel and the NT7R58AA Maintenance Panel assemblies installation.
- 2 Install the appropriate connector housing kit if you cannot find existing empty connector cutouts.
- 3 If required, install the P0702380 connector housing kit, which mounts at the top of the cabinet for NT and XT systems.

- 4 Install the NT7R57AA Carrier Panel assembly and the NT7R58AA Maintenance Panel assembly in the connector cutouts by using screws at each end of the selected connector cutout. Remember these panel assemblies are integral parts of the NT7R67BA cable assembly. Install the NT7R57AA Carrier Panel so that the 8-pin modular jack tabs are to the left placing carrier 0 at the top as shown in [Figure 14](#).
- 5 Install the adapter plate covering 5 adjacent connector slots on top of the connector housing.

Connecting the cables to the faceplate connectors

To connect the NT7R51 Local Carrier Interface card to the MMI port, the SDI port, and the carrier links, refer to [Figure 14](#) and follow these steps:

- 1 Plug the DB-25 male connector of the NT7R69AA Extension Local Carrier Cable into the DB-25 female connector located on the NT7R51 Local Carrier Interface card faceplate.
- 2 Plug the DB-25 female connector of the NT7R69AA Extension Local Carrier Cable into the DB-25 male P1 connector of the NT7R67BA Local Carrier/Monitor Cable assembly.
- 3 Verify that the P2 and P3 connectors of the NT7R67BA Local Carrier/Monitor Cable Assembly are connected to the NT7R57AA Carrier Panel assembly and the NT7R58AA Maintenance Panel assembly, as follows:
 - The P3 DB-15 HD female connector is connected to the DB-15 HD male connector of the NT7R57AA Carrier Panel assembly.
 - The P2 DB-15 HD male NT7R67BA cable assembly connector is connected to the DB-15 HD female connector of the NT7R58AA Maintenance Panel assembly.

Note: These panel assemblies and the NT7R67HA cable are parts of the NT7R67BA Local Carrier/Monitor Cable Assembly and are normally attached to the cable connectors in the factory. These panels cannot be ordered separately, they have to be ordered as the NT7R67BA cable assembly.

Installing SDI and MMI terminal cables

The NT7R58AA Maintenance Panel assembly provides connectors to connect the NT7R51 Local Carrier Interface card to the MMI terminal and to an SDI port as shown in Figure 12 on page 84.

Connecting a single Local Carrier Interface card to the MMI terminal in the NT or XT cabinet

- 1 To connect a single NT7R51 Local Carrier Interface card to the MMI terminal:

Note: Refer to Appendix C, [Figure 27](#) for connection diagrams and tables listing pin assignment information for all external connectors that connect to the SDI port, the MMI terminal, the system monitor card, the external alarms, and the carrier links.

- Plug the NT7R69AA Extension cable DB-9 male connector into the DB-9 female connector on the NT7R58AA Maintenance Panel assembly.
- Plug the DB-9 male P1 connector at the common end of the NT7R67DA Local External Maintenance Cable assembly into the NT7R69AA Extension cable DB-9 female connector.
- Plug the DB-9 male P3 connector of the NT7R67DA cable assembly into the DB-9 female connector of the NT7R66BA MMI Cable.
- Plug the DB-25 male end of the NT7R66BA MMI Cable into the MMI terminal RS-232 connector. If you have to change the gender at the terminal, use the appropriate compact gender changer such as a DB-25F/DB-25F gender changer.
- To connect P3 DB-9 female connector of the NT7R67DA Local External Maintenance Cable directly to the DB-9 male RS-232 serial communication port of a laptop computer, use the NT7R66BA MMI Cable and the appropriate compact gender changer.

2 MMI terminal connection using a modem:

- If you need a modem to connect a distant MMI terminal to the MMI port on the NT or XT system I/O housing, plug the DB-9 female connector of the NT7R66BA MMI Cable into the P3 DB-9 male connector of the NT7R67DA cable.
- Plug the DB-25 male end of the NT7R66BA MMI Cable into a DB-25F/DB-25M nullmodem.
- Connect the nullmodem DB-25 male connector to the modem DB-25 female connector.

3 MMI terminal connection using an A/B switch box:

- Connect the P3 of the NT7R67DA Local External Maintenance Cable assembly DB-9 male connector into the DB-9 female connector of the NT7R66BA MMI Cable.
- Plug the DB-25 male end of the NT7R66BA MMI Cable into the A/B switch box DB-25 female C connector.
- From the switch box, you can connect a local MMI terminal directly to the A position on the switch box using a standard DB-25M/DB-25M straight-through cable.
- You can also connect a distant MMI terminal over a standard DB-25M/DB-25M straight-through cable, a nullmodem, and a modem to the switch box B position.

4 Terminal/Modem connections over the MSDL Single Terminal Access:

- To avoid using the A/B switch box, you can use three ports on the MSDL card.
- Connect one MSDL port to the Meridian 1 local MMI terminal
- Connect the second MSDL port to a modem.
- Connect the third MSDL port to the P3 DB-9 male connector of the NT7R67DA Local External Maintenance Cable assembly using the NT7R66BA MMI Cable.

Connecting a single Local Carrier Interface card to the SDI card in the NT or XT cabinet

Refer to Appendix C and [Figure 27](#) to see the SDI connection diagram.

- 1** To connect a single NT7R51 Local Carrier Interface card to the QPC 841 or other SDI cards:
 - Route the DB-9 female P2 connector of the NT7R67DA cable assembly of the Local Carrier Interface card to an available SDI port on an SDI card.
 - Plug the DB-9 male connector of the NT8D93AJ XSDI I/O cable into the DB-9 female SDI connector on the I/O panel.
 - Plug the DB-25 male connector of the NT8D93AJ XSDI I/O cable into the DB-25 female connector on the NT7R66AA SDI Cable Kit.
 - Plug the DB-9 male connector of the NT7R66AA SDI Cable Kit into the DB-9 female connector into the NT7R67DA cable P2 connector.
- 2** To connect other SDI cards:
 - Route and install the DB-9 female P2 connector of the NT7R67DA cable assembly to an available SDI port on an SDI card.
 - Plug the DB-25 male connector of the NT7R66AA SDI Cable Kit (do not use the DB-25F/DB-25F adapter) to connect the DB-25 female SDI connector at the I/O panel.
 - Plug the DB-9 male connector on the NT7R66AA SDI Cable Kit into the P2 connector on the NT7R67DA cable.

To test the MMI and Host SDI login, refer to “MMI mode” on page 139 and “Host SDI mode” on page 141 for login instructions.

Note: For additional information about types of SDI cards, their SDI ports, and special cables required to connect these ports, refer to *Meridian 1 serial data interface cards description* (553-3001-107).

Connecting multiple Local Carrier Interface cards to the MMI terminal

Make sure that all the NT7R51 Local Carrier Interface cards in the NT or XT system are properly configured for the daisy-chain card addressing as shown in Figure 9 “Local Carrier Interface card DIP-switch positions and function” on page 69 and Appendix C, [Figure 28](#).

Make sure the NT7R67CA Local Daisy-chain Cable Assembly is installed for all Local Carrier Interface cards in the daisy-chain. Refer to “Installing the NT7R67CA Local daisy-chain cable” on page 75.

- 1** To connect multiple NT7R51 Local Carrier Interface cards in a daisy-chain configuration and to the MMI terminal, connect the cables as shown in [Figure 12](#) and Appendix C, [Figure 28](#):
 - Plug an NT7R69AA Extension cable DB-9 male connector into each DB-9 female connector on each NT7R58AA Maintenance Panel assembly belonging to Local Carrier Interface card #1.
 - Plug the DB-9 male P1 connector at the NT7R67DA Local External Maintenance Cable assembly #1 into the corresponding NT7R69AA Extension cable DB-9 female connector for Local Carrier Interface card #1.
 - Plug the NT7R67DA cable assembly #2 into the NT7R69AA Extension cable DB-9 female connector for Local Carrier Interface card #2.
 - Connect the DB-9 male P3 connector from the cable in position #1 with the DB-9 female P2 connector of the NT7R67DA cable assembly in position #2.
 - Plug the NT7R67DA cable assembly #3 into the NT7R69AA Extension cable DB-9 female connector for Local Carrier Interface card #3.
 - Connect the DB-9 male P3 connector from the cable in position #2 with the DB-9 female P2 connector of the NT7R67DA cable assembly in position #3.
 - Plug the DB-9 male P3 connector of the NT7R67DA cable assembly in position #3 into the DB-9 female connector of the 3NT7R66BA MMI Cable.
 - Plug the DB-25 male end of the NT7R66BA MMI Cable into the DB-25 female connector of the MMI terminal RS-232 connector. If you have to change the gender at the terminal, use the appropriate compact gender changer.

2 MMI terminal connection using a modem:

- If you need a modem to connect a distant MMI terminal to the MMI port on the Meridian 1 I/O panel, plug the DB-9 female connector of the NT7R66BA MMI Cable into the P3 DB-9 male connector of the NT7R67DA cable.
- Plug the DB-25 male connector of the NT7R66BA MMI Cable into the DB-25 female end of a DB-25F/DB-25M nullmodem.
- Connect the nullmodem DB-25 male connector to the modem DB-25 female connector.

3 MMI terminal connection using an A/B switch box:

- Connect the P3 of the NT7R67DA Local External Maintenance Cable assembly DB-9 male connector into the DB-9 female connector of the NT7R66BA MMI Cable.
- Plug the DB-25 male and of the NT7R66BA MMI Cable into the A/B switch box DB-25 female C connector.
- From the switch box, you can connect a local MMI terminal directly to the A position on the switch box using a standard DB-25M/DB-25M straight-through cable.
- You can also connect a distant MMI terminal over a standard DB-25M/DB-25M straight-through cable, a nullmodem, and a modem to the switch box B position.

4 Terminal/Modem connections over the MSDL Single Terminal Access:

- To avoid using the A/B switch box, you can use three ports on the MSDL card.
- Connect one MSDL port to the Meridian 1 local MMI terminal
- Connect the second MSDL port to a modem.

- Connect the third MSDL port to the P3 DB-9 male connector of the NT7R67DA Local External Maintenance Cable assembly by using the NT7R66BA MMI Cable.

Connecting multiple Local Carrier Interface cards to the SDI card

Refer to Appendix C, [Figure 28](#) to see the SDI connection diagram.

- 1 To connect a single NT7R51 Local Carrier Interface card to the QPC 841 or other SDI cards:
 - Route the DB-9 female P2 connector of the NT7R67DA cable assembly of the Local Carrier Interface card #1 to an available SDI port on an SDI card.
 - Plug the DB-9 male connector of the NT8D93AJ XSDI I/O cable into the DB-9 female SDI connector on the I/O panel.
 - Plug the DB-25 male connector of the NT8D93AJ XSDI I/O cable into the DB-25 female connector on the NT7R66AA SDI Cable Kit.
 - Plug the DB-9 male connector of the NT7R66AA SDI Cable Kit into the DB-9 female connector into the NT7R67DA cable P2 connector.
- 2 To connect other SDI cards:
 - Route and install the DB-9 female P2 connector of the NT7R67DA cable assembly of the Local Carrier Interface card #1 to an available SDI port on an SDI card.
 - Plug the DB-25 male connector of the NT7R66AA SDI Cable Kit to connect the DB-25 female SDI connector at the I/O panel. (The DB-25F/DB-25F adapter is not used).
 - Plug the DB-9 male connector on the NT7R66AA SDI Cable Kit into the P2 connector on the NT7R67DA cable.
- 3 Secure cables with tie-wraps as appropriate.

To test the MMI and Host SDI login, refer to “MMI mode” on page 139 and “Host SDI mode” on page 141 for login instructions.

Note: For additional information about types of SDI cards, their SDI ports, and special cables required to connect these ports, refer to *Meridian 1 serial data interface cards description* (553-3001-107).

Connecting carrier links to the NT/XT system cabinet

The T1 or E1 carrier links are connected to the NT7R57AA Carrier Panel assembly at the top of NT and XT system cabinets. Carrier links are routed from the telco demarcation point to the system cabinet I/O panel containing NT7R57AA Carrier Panel assembly with three 8-pin modular jacks, as shown in Figure 14 on page 93.

Note 1: Before connecting the carrier link to the system, the connection between the telco demarcation point such as CSU, should have been completed using the NT7R87AA T1 CSU Cable Kit.

Note 2: To connect an E1 carrier link terminated with BNC connectors, use the NT7R67EA Coaxial Interface Adapter Cable to connect 8-pin modular jacks at the I/O panel to the BNC connector on each E1 carrier link coming from the telco demarcation point. Also refer to [Figure 9](#) and [Figure 15](#) to set SW1, SW2, SW5, and SW8 for E1 carrier impedance of 75 Ohm.

To connect carrier links to the NT7R57AA Carrier Panel assembly at the local system site:

- 1 Route the three carrier links to the top of the NT and XT systems cabinets.
- 2 Identify carrier 0, 1, and 2 connectors and the corresponding NT7R57AA Carrier Panel assembly 8-pin modular jacks.
- 3 Plug the carrier link cable 8-pin modular plugs into the corresponding NT7R57AA Carrier Panel assembly 8-pin modular jacks for each carrier.
- 4 Record the telco carrier circuit ID for each carrier link (link 0, 1, and 2).

Note: These carrier circuit IDs will be used at the remote site to identify links that corresponds to carrier 0, 1, and 2 at the local site. This will prevent mismatch of carrier links between the Local Carrier Interface card and the Remote Carrier Interface card. Record the connection information on the [“Carrier Remote IPE Connection Record label” on page 65.](#)

- 5 If an E1 coaxial carrier link is terminated with BNC connectors, use one NT7R67EA Coaxial Interface Adapter cable to connect each 8-pin modular jack on the NT7R57AA Carrier Panel assembly to BNC carrier link connectors.
- 6 Identify BNC connectors on each NT7R67EA Coaxial Interface Adapter cable that corresponds to the appropriate carrier (carrier 0, carrier 1, and carrier 2) at the NT7R57AA Carrier Panel Assembly 8-pin jack.
- 7 Connect each NT7R67EA Coaxial Interface Adapter BNC connector to the appropriate BNC connector on the carrier link.
- 8 Secure all carrier link cables with tie-wraps as appropriate.

Carrier Remote IPE column installation

To complete the installation of the Carrier Remote IPE column equipment, you must:

- install the Carrier Remote IPE column
- install the cards into the IPE module
- install the cable assemblies from the I/O panel to the backplane
- connect carrier links to the carrier panel assembly
- configure the carrier equipment using overlays and MMI commands

Note: All Carrier Remote IPE modules or cabinets are preinstalled in the factory with cards already in their respective card slots. The only exception is the power supply, which is packaged separately and must be installed at the site.

Installing the Carrier Remote IPE column

The column is normally assembled in the factory with cards already installed and the cable already connected between the backplane connector and the I/O panel at the rear of the IPE module.

If the column is not assembled in the factory, you will need to install the Meridian 1 type modular column (floor-standing column) at the remote site. To do this, follow the instructions in *Meridian 1 system installation procedures* (553-3001-210). It describes how to install the pedestal, the IPE module, and the top cap, and how to connect the power, the internal and external communication cables, and subscriber loops.

To install the Power Fail Transfer Unit (PFTU) to the Carrier Remote IPE column, follow the instructions in *Meridian 1 system installation procedures* (553-3001-210).

Installing cards into the Remote IPE module

The following steps show you how and where to install the NT7R52 Remote Carrier Interface card and other IPE cards in the Remote IPE module. Although the cards usually are shipped installed from the factory, this document provides step-by-step card installation, which should be followed when additional IPE cards are installed or defective cards are replaced.

To install cards in the Remote IPE Module:

- 1 Set the DIP switches on the NT7R52 Remote Carrier Interface card to specify the carrier type (T1 or E1), the distance to the first repeater, the MMI terminal baud rate, and the system monitor address. The DIP switch setting will depend on the physical system configuration.
- 2 Verify that SW1 position 2 is set to **ON** to specify the remote site.

Note: [Figure 15](#) shows the location of the DIP switches and their functions. Switches 2, 3, and 4 determine if carrier 0 is a T1 or an E1 link, switches 4, 6, and 7 determine if carrier 1 is a T1 or an E1 link, and switches 8, 9, and 10 determine if carrier 2 is a T1 or an E1 link. All three carrier links must be of the same type, for example, T1 or E1. DIP switches S 1 and SW11 define parameter listed in the table in [Figure 15](#). Correspondingly, Figure 9 “Local Carrier Interface card DIP-switch positions and function” on page 69, shows the Local Carrier Interface card DIP switches SW1 through SW11 and their functions. Refer to Figure 9 “Local Carrier Interface card DIP-switch positions and function” on page 69 for DIP switch settings for the Local Carrier Interface card.

- 3** Determine the system monitor address for each remote site by setting SW11 positions 1-5 on the Remote Carrier Interface card. Before you select the address, you must determine which are the available system monitor addresses, as follows:
- Execute the **STAT XSM** command in **LD 37** to poll all system monitors. Correct any problems.
 - Determine available system monitor addresses to be assigned to the Remote IPE module or the wall-mounted Carrier Remote IPE cabinet.
 - Set master system monitor slave polling address range to cover the new Carrier Remote IPE system monitor address.
 - Set Remote Carrier Interface card **SW 11** positions **1-5** for the new system monitor address.
 - Re-connect the system monitor daisy-chain to include new Local Carrier Interface cards.
 - Test the system monitor daisy-chain by executing the **STAT XSM** command in **LD 37** to ensure that every local and remote system monitor or Remote Carrier Interface card system monitor emulation in the remote cabinet is responding to the master system monitor.

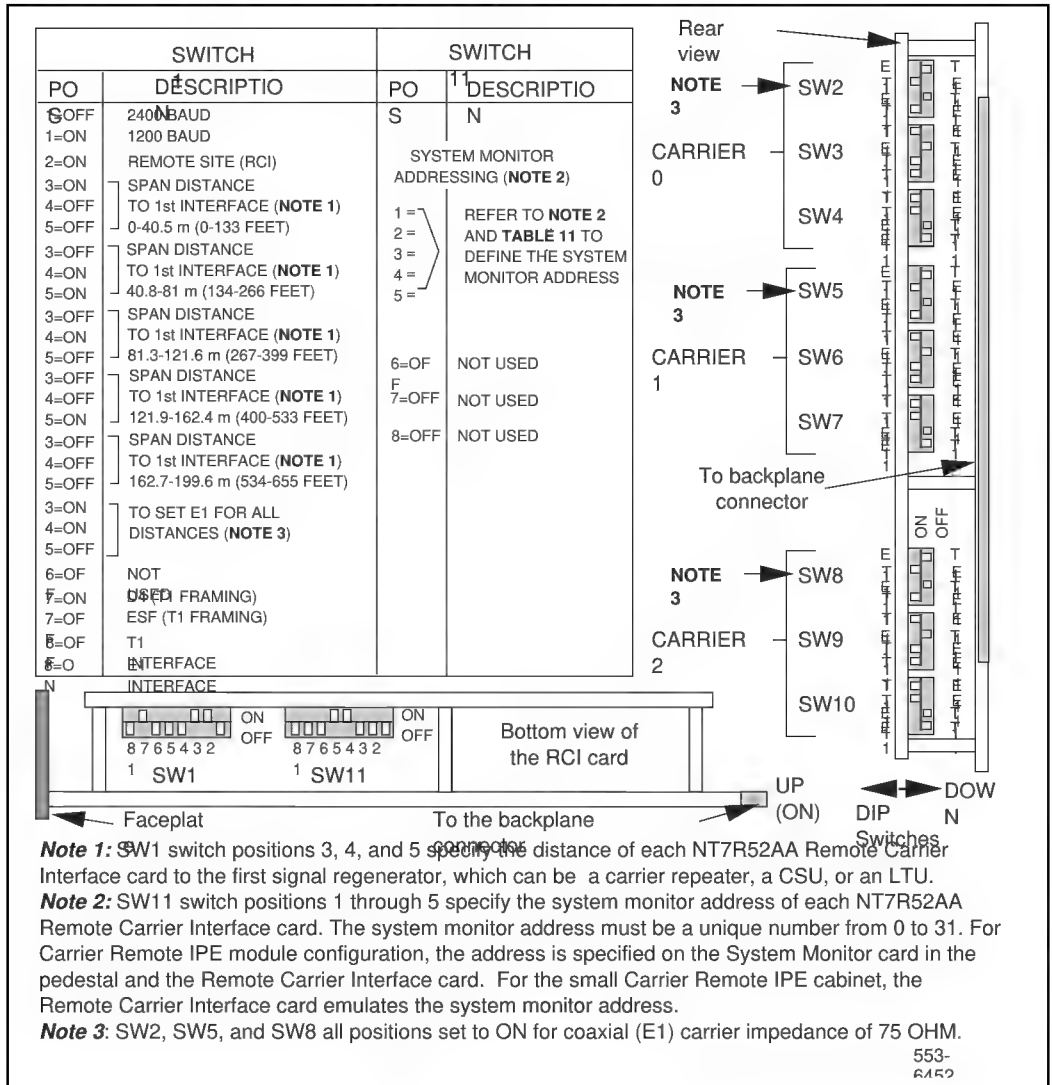
[Table 12](#) lists the default (factory provided switch settings) for the Remote Carrier Interface card. These settings can be used in the majority of applications, however, if different settings are required, you should change the switch settings before installing the Remote Carrier Interface card.

Table 12
Remote Carrier Interface standard (default) switch settings

Switch	Switch positions							
	1	2	3	4	5	6	7	8
SW1	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
SW11	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
SW2	OFF	ON	OFF	ON	-	-	-	-
SW3	ON	OFF	ON	ON	-	-	-	-
SW4	ON	ON	OFF	OFF	-	-	-	-
SW5	OFF	ON	OFF	ON	-	-	-	-
SW6	ON	OFF	ON	ON	-	-	-	-
SW7	ON	ON	OFF	OFF	-	-	-	-
SW8	OFF	ON	OFF	ON	-	-	-	-
SW9	ON	OFF	ON	ON	-	-	-	-
SW10	ON	ON	OFF	OFF	-	-	-	-

Figure 15 shows the NT7R52AA Remote Carrier Interface card DIP switches. SW2 through SW10 select the carrier characteristic. SW1 and SW11 define repeater distance, baud rate, and system monitor address.

Figure 15
Remote Carrier Interface card DIP-switch locations and functions



[Table 13](#) lists system monitor addresses for the Remote Carrier Interface card, which are selected using switch SW11 switch positions 1 through 5. A unique address is selected for each Remote Carrier Interface card. Refer to [Figure 15](#) for the SW11 switch location on the card.

Table 13
NT7R52 Remote Carrier Interface card system
monitor address selection

RCI System Monitor Address	SW11 Positions 1–5 (1 = ON, 0 = OFF)				
	1	2	3	4	5
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	0	1	1
4	0	0	1	0	0
5	0	0	1	0	1
6	0	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0
9	0	1	0	0	1
10	0	1	0	1	0
11	0	1	0	1	1
12	0	1	1	0	0
13	0	1	1	0	1
14	0	1	1	1	0
15	0	1	1	1	1
16	1	0	0	0	0
17	1	0	0	0	1
18	1	0	0	1	0
19	1	0	0	1	1
20	1	0	1	0	0
21	1	0	1	0	1
22	1	0	1	1	0
23	1	0	1	1	1
24	1	1	0	0	0
25	1	1	0	0	1
26	1	1	0	1	0
27	1	1	0	1	1
28	1	1	1	0	0
29	1	1	1	0	1
30	1	1	1	1	0
31	1	1	1	1	1

- 4 Pull the NT7R52AA Remote Carrier Interface card locking devices away from the faceplate. Holding the card by these locking devices, insert it into the card guides in the card slot marked *Cont.*, which is located to the right of slot 7. Make sure to use the card guides immediately to the right of slot 7.
- 5 Slide the card into the module until it engages the backplane connector.
- 6 Push the locking device levers towards the faceplate to insert the card connector into the backplane connector and lock the card in place.
- 7 Observe the LED on the card as it performs self-tests. The LED should blink three times and then stay on until enabled by software. When enabled by software, the LED turns off permanently, if operational.
- 8 Install IPE cards in slots 0 through 7 and 8 through 15 by pulling the card locking devices away from the faceplate and inserting the card into the card guides of an IPE card slot.
- 9 Slide the card into the module until it engages the backplane connector and then push the locking device levers toward the faceplate to insert the card connector into the backplane connector and lock the card in place.
- 10 Repeat steps 7 and 8 for each IPE card.

Installing the backplane cable assemblies

The Remote Carrier Interface card backplane connectors provide access to three carrier links, the system monitor, external alarms, and the MMI maintenance port. The NT7R68AA Remote Carrier/Alarm Cable assembly is routed from the Remote Carrier Interface card lower backplane connector SL1 to the I/O panel connectors that support carrier link and auxiliary or external alarm connections. The NT7R68BA Remote Maintenance Cable assembly connects the upper backplane connector SL0 to the I/O panel connectors that support the system monitor and the SDI/MMI terminal connections.

Installing the NT7R68AA Remote Carrier/Alarm Cable Assembly

The NT7R68AA Remote Carrier/Alarm Cable assembly consists of the NT7R68HA cable, the NT7R59AA Carrier Panel, and NT7R60AA Carrier/Alarm Panel assemblies.

Before you can plug the cables into the IPE module backplane, you must install the NT7R59AA Carrier Panel and NT7R60AA Carrier/Alarm Panel assemblies into the connector cutouts on the I/O panel at the rear of the IPE module, refer to [Figure 16](#) and Appendix C, [Figure 29](#) for details. To install the panel assemblies:

- 1** Remove the back panel at the rear of the IPE module to be able to access the I/O panel connector cutouts.
- 2** Identify the empty connector cutouts that are the appropriate size for the panel assemblies. Refer to “Carrier Remote IPE Module I/O panel connector selection” on page 63 for connector cutouts selection recommendation.
- 3** Install the NT7R59AA Carrier Panel assembly into the recommended connector cutout in the I/O panel. Install it so that 8-pin modular jack tabs are positioned to the left of the connectors, placing carrier 0 at the top of the NT7R59AA Carrier Panel assembly and carrier 1 at the bottom. Tighten the retaining screw.
- 4** Install the NT7R60AA Carrier/Alarm Panel assembly into the recommended J5 empty connector cutout in the I/O panel. Tighten the retaining screw. This panel contains an 8-pin modular jack for carrier 2 at the bottom and a DB-15 HD female auxiliary alarm (external alarm) connector at the top of the panel assembly.
- 5** Plug the P1 24-pin block connector of the NT7R68AA Remote Carrier/Alarm Cable assembly into the SL1 connector on the IPE Module’s backplane.

Installing the NT7R68BA Remote Maintenance Cable Assembly

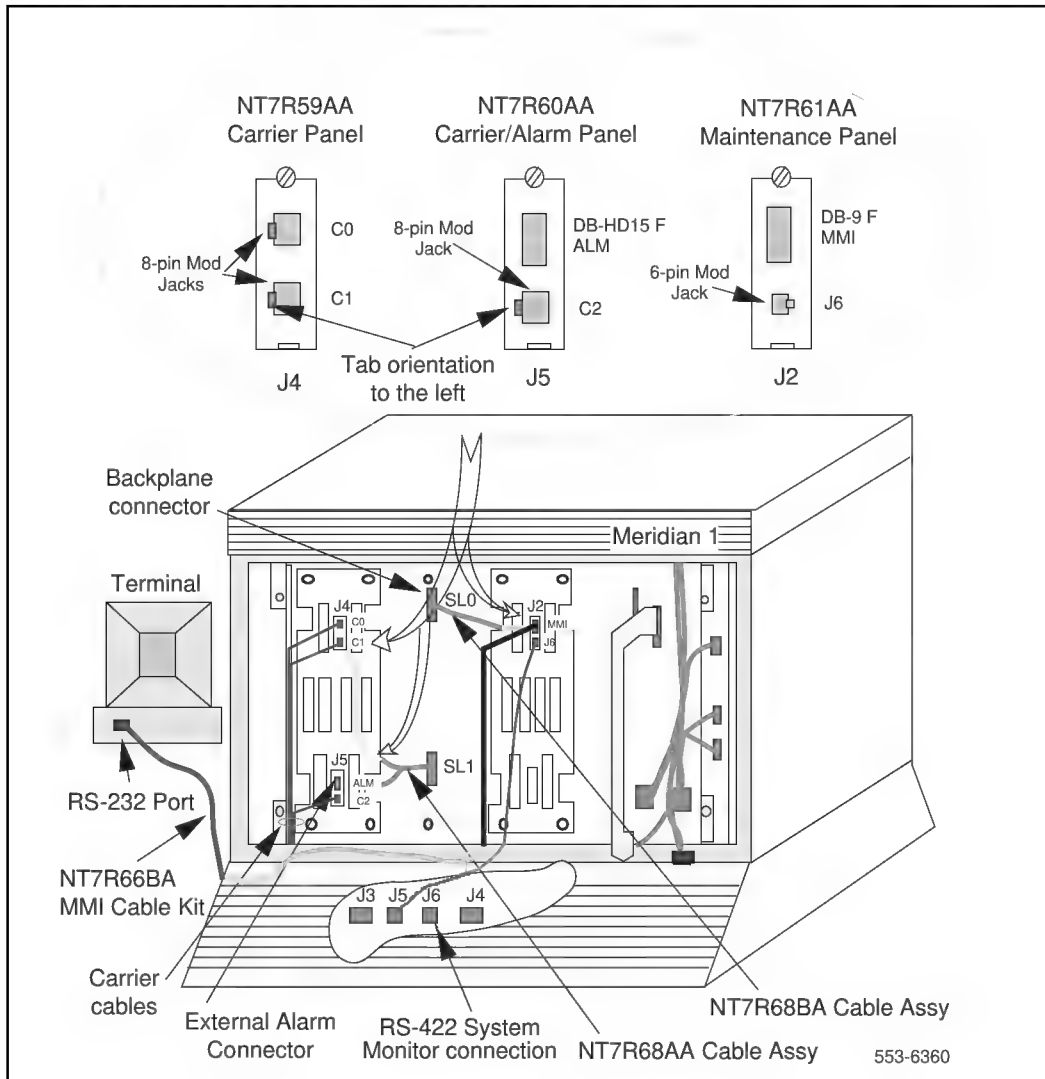
The NT7R68BA Remote Maintenance Cable assembly consists of the NT7R68GA cable and NT7R61AA Maintenance Panel assembly.

Before you can plug the cable into the IPE module backplane, you must install the NT7R61AA Maintenance Panel assembly into the connector cutout on the I/O panel at the rear of the IPE module, refer to [Figure 16](#) and Appendix C, [Figure 29](#). To install the panel assembly:

- 1** Identify the **empty** connector cutout that is the appropriate size for the NT7R61AA Maintenance Panel assembly. Refer to “Carrier Remote IPE Module I/O panel connector selection” on page 63 or connector cutouts selection recommendation.
- 2** Install the NT7R61AA Maintenance Panel assembly into the recommended J2 connector cutout on the I/O panel. Tighten the retaining screw.
- 3** Plug the P1 24-pin connector of the NT7R68BA Remote Maintenance Cable assembly into the SL0 connector on the IPE Module’s backplane.

Figure 16 shows the rear of the Carrier Remote IPE module and cables connecting the backplane connectors to the module's I/O panel assembly connectors installed into the recommended connector cutouts.

Figure 16
Backplane to I/O panel connections on the IPE module



Installing system monitor cables

The NT8D46AL system monitor cable is normally installed in the factory and does not have to be installed at the site.

In the remote floor-standing column, the pedestal contains a slave system monitor used to monitor Carrier Remote IPE system alarms. These alarms are reported over the carrier link and the Local Carrier Interface card to the Meridian 1 master system monitor and from there to the CPU. The CPU sends PWR alarm messages to the system maintenance TTY identifying the problem.

Figure 16 shows the system monitor cable connections for a Carrier Remote IPE column. To connect the slave system monitor in the pedestal:

- 1** Plug the 6-pin modular plug at one end of the NT8D46AL cable into the J6 6-pin modular jack on the IPE module NT7R61AA Remote Maintenance Panel assembly. This cable provides an RS-422 interface to the system monitor.
- 2** Plug the other end of the NT8D46AL cable 6-pin modular plug into the J5 modular jack on the system monitor in the pedestal.
- 3** Check the NT8D22 System Monitor factory switch settings for the slave system monitor. Refer to “Option settings” in *Circuit card installation and testing* (553-3001-211).

Note: Set the system monitor address on the system monitor card in the pedestal to be identical to the system monitor address set on the Remote Carrier Interface card using SW11 switch positions 1 through 5. Set the slave system monitor to the same address that corresponds to the master system monitor at the local site.

- 4** For multiple Carrier Remote IPE modules on a single pedestal, connect only one Remote Carrier Interface card to the system monitor in the pedestal. However, set the system monitor address on all Remote Carrier Interface cards to be the same as the system monitor address in the pedestal. This will allow you to connect any Remote Carrier Interface card to the system monitor in the pedestal.

Installing remote MMI terminal cables

The cable that has to be installed at the site is the terminal cable connecting the terminal or TTY to the DB-9 female connector on the NT7R61AA Remote Maintenance Panel assembly.

[Figure 16](#) shows the MMI terminal cable connections for a Carrier Remote IPE column. Also, refer to and Appendix C, [Figure 29](#). To connect the MMI terminal:

- 1 Plug the DB-9 female connector of the NT7R66BA MMI Cable into the MMI DB-9 male connector on the IPE module NT7R61AA Remote Maintenance Panel assembly.
- 2 Plug the other end of the NT7R66BA MMI Cable DB-25 male connector into the MMI terminal RS-232 connector. If the MMI terminal has a male connector, use a compact gender changer to connect the MMI terminal.
- 3 If an distant MMI terminal is connected to the MMI connector on the Maintenance Panel Assembly over a modem, use the NT7R66BA MMI Cable and a nullmodem to connect the modem to the MMI D-9 male connector on the NT7R61AA Remote Maintenance Panel Assembly.
- 4 For multiple Carrier Remote IPE modules at a single site, use an A/B/C switch box to connect each MMI DB-9 male connector on the Maintenance Panel assembly to a single MMI terminal. To do this, use the NT7R66BA MMI Cable between the A/B switch box connector C and the MMI connector on each IPE module. Use a DB-25M/ DB-25M straight through cable to connect the A/B switch box connector A to the MMI terminal.

Note: Appendix C provides the external connectors pin assignment for the SDI port, the MMI terminal, the carrier links, and the external alarms.

Connecting the carrier link to the Remote IPE module

The T1 or E1 carrier links are connected to the I/O panel assembly at the rear of the IPE module housing the Remote Carrier Interface card. Carrier links are routed from the telco demarcation point to the Carrier Remote IPE column for connection to the NT7R59AA Carrier Panel and the NT7R60AA Carrier/Alarm Panel assembly. The NT7R59AA Carrier Panel assembly contains two 8-pin modular jacks and the NT7R60AA Carrier/Alarm Panel assembly contains one 8-pin modular jack, which are used to connect carrier links. [Figure 16](#) shows the carrier connectors and the carrier link cable routing.

Note 1: Before connecting the carrier link to the system, the connection between the telco demarcation point such as CSU, should have been completed using the NT7R87AA T1 CSU Cable Kit.

Note 2: To connect an E1 carrier terminated with BNC connectors, use the NT7R67EA Coaxial Interface Adapter Cable to connect the 8-pin modular jacks at the I/O panel to the BNC connector on each E1 carrier link coming from the telco demarcation point. Also refer to [Figure 9](#) and [Figure 15](#) to set SW1, SW2, SW5, and SW8 for E1 operation and carrier impedance of 75 Ohm.

To connect carrier links to the IPE module's NT7R59AA Carrier Panel and NT7R60AA Carrier/Alarm Panel assemblies at the remote site:

- 1 Route all three carrier links to the rear of the Carrier Remote IPE column housing the Remote Carrier Interface card.
- 2 Identify carrier 0 (primary), carrier 1 (primary), and carrier 2 (primary or spare) and the corresponding connectors on the NT7R59AA Carrier Panel and the NT7R60AA Carrier/Alarm Panel assemblies.

Note: Compare carrier circuit ID numbers of carrier links at the local site (that you recorded during the installation of the carrier links at the local site) with the carrier circuit ID numbers of the carrier links at the remote site. Make sure they match so that the circuit ID of carrier 0 at the local site matches with circuit ID of carrier 0 at the remote site. Repeat this matching for carrier 1 and carrier 2. This will eliminate cross-connection of carrier links, which causes transmission problems. Refer to "Verifying carrier link connections at the remote site" on page 147.

- 3 Plug each carrier cable 8-pin modular plug into the corresponding 8-pin modular jack on the NT7R59AA Carrier Panel and the NT7R60AA Carrier/Alarm Panel assemblies for each T1 carrier.
- 4 If an E1 coaxial carrier link is terminated with BNC connectors, use one NT7R67EA Coaxial Interface Adapter cable to connect each 8-pin modular jack on the NT7R59AA Carrier Panel and NT7R60AA Carrier/Alarm Panel assemblies to BNC carrier link connectors.
- 5 Identify BNC connectors on each NT7R67EA Coaxial Interface Adapter cable that corresponds to the appropriate carrier (carrier 0, carrier 1, and carrier 2) at the NT7R57AA Carrier Panel Assembly 8-pin jack.
- 6 Connect each NT7R67EA Coaxial Interface Adapter BNC connector to the appropriate BNC connector on the carrier link.

Note: These carrier link connections will be verified at the end of hardware installation by executing appropriate MMI commands on the MMI terminal. Refer to “Verifying carrier link connections at the remote site” on page 147.

- 7 Secure the carrier link cables with tie-wraps as appropriate.

The NT7R60AA Maintenance Panel assembly that contains one 8-pin modular jack for carrier 2, also contains the DB-15HD female external alarm input connector. This DB-15HD connector connects the NT7R86AA Auxiliary Alarm Cable assembly to auxiliary alarm (external alarm) indicators at the MDF or directly to the auxiliary alarm devices. These alarm devices report alarm conditions through relay contact closures.

Carrier Remote IPE cabinet installation

To complete the installation of Carrier Remote IPE cabinet equipment, you must:

- install the Carrier Remote IPE cabinet(s)
- install cards into the cabinet(s)
- install the Remote Cabinet Cable assembly and connect to the backplane
- connect the carrier links

Installing the Carrier Remote IPE cabinet

To install NT1P70/NT1P60 main and NTBK70 expansion Carrier Remote IPE cabinets that house the Carrier Remote IPE, follow the instructions in this section.

Note: The NT1P70 is the Main Cabinet Assembly consisting of the NT1P60 Main Cabinet and cabinet mounting hardware.

The NT1P70/NT1P60 Remote Carrier IPE main cabinet is shipped from the factory installed, that is, all IPE cards and the Remote Carrier Interface card are already installed. The exceptions are the NT7R94AA Remote Cabinet Cable Assembly and the power supply, which are shipped separately. The NTBK70 Carrier Remote IPE expansion cabinet (also used in Option 11) is optional and is ordered only if you require more than 10 IPE cards at the remote site.

The Carrier Remote IPE cabinet can be powered with an AC power system using the NTAK04 AC/DC power supply. It can also be powered with a DC power system using the NTAK05 DC power supply from a –52 V battery source through the NTAK28AA Junction box and the NTAK410 power cable. Before you install the power supply into the cabinet set switches SW1 through SW 4 as shown in [Table 14](#):

Table 14
NTAK04 AC/DC and NTAK05 DC power supply switch settings

Voltage	SW1	SW2	SW3	SW4
Message Waiting; -150 V	ON			
Message Waiting; -120 V	OFF			
Ringing; 86 Vrms		OFF	OFF	OFF
Ringing; 80 Vrms		ON	OFF	OFF
Ringing; 75 Vrms		OFF	ON	OFF
Ringing; 70 Vrms		OFF	OFF	ON
Note: Ringing frequency selection is made with a three-way switch located to the left of the 4-position DIP switch at the top of the power supply. Typical North American setting is -150 V, 86 Vrms, and 20 Hz.				

To install Carrier Remote IPE Cabinets, locate and prepare the wall area for the wall-mounted installation or use the pedestal for the floor installation, install cabinets, connect the ground wires, and connect the power. When selecting the wall area for the cabinet installation, make sure you provide for convenient carrier and subscriber loop cable routing.

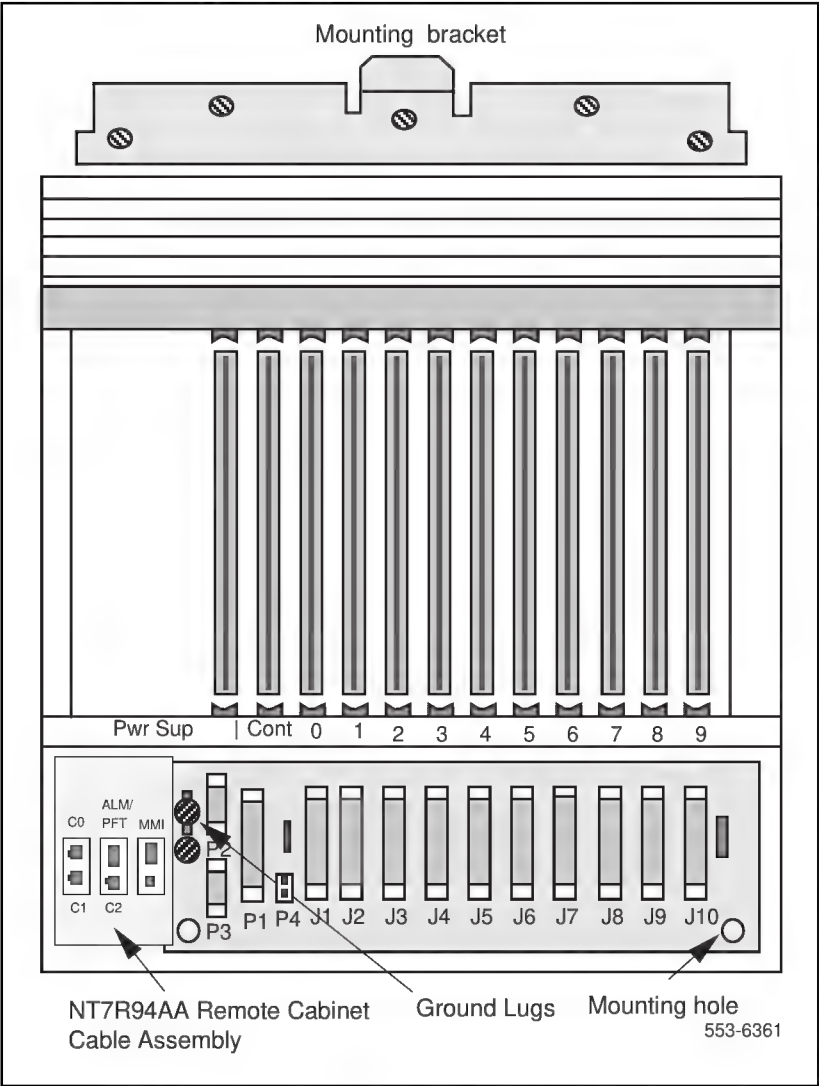
To complete these tasks, follow the steps below:

- 1 Unpack and inspect the cabinet.
- 2 Level and install the mounting bracket on the wall as shown in [Figure 17](#). If you are installing the expansion cabinet next to the main, line up the two brackets and use the provided spacer between brackets.

- 3 Remove the front cover and all cards from the cabinet to make the cabinet lighter and to prevent card damage in case the cabinet drops when being installed onto the wall.
- 4 Position the cabinet over the mounting bracket so that the bracket hook engages the slot at the rear of the cabinet. The slot is located at the top center of the cabinet as shown in [Figure 17](#).
- 5 Bolt the cabinet to the wall by using two wood screws at the lower front of the cabinet. See [Figure 17](#) for screw hole locations.
- 6 Install the 6 AWG copper ground wire between the approved building ground and the ground lug at the bottom of the cabinet.
- 7 Repeat steps 3 through 6 for the expansion cabinet, if required.
- 8 Install the power supply in the *Pwr Sup* slot in the NT1P70/NT1P60 main cabinet shelf and turn the power switch to OFF.
- 9 At the building ground end of the wire, use two fastening clamps to connect the wire to the building ground, insulate the connection with electric tape, and post a DO NOT DISCONNECT tag.
- 10 Disconnect the building ground wire at the ground lug on the NT1P70/NT1P60 main cabinet and measure the resistance between the tip of the disconnected ground wire and the ground lug on the cabinet. If the resistance is more than 5 ohms, check the building ground and the ground terminal at the AC wall outlet where the cabinet power cord is connected.
- 11 For an AC system, connect the NTAK98AA Power Cord from the IPE shelf NTAK04 AC/DC power supply to the commercial AC power outlet. For a DC system, connect the IPE shelf NTAK05 DC power converter cord to the DC power source over the NTAK28AA Junction Box and the NTAK410 power cable.
- 12 Measure the ground resistance between the ground lug at the bottom of the NT1P70/NT1P60 main cabinet and the ground prong on the cabinet power cord. It should measure 0 ohms. If the resistance is greater than 0 ohms, check the ground terminal on the power supply power connector for continuity to the cabinet chassis.

Figure 17 shows the Carrier Remote IPE cabinet with the mounting bracket and the mounting holes. It also shows the ground lugs for ground connections.

Figure 17
 Carrier Remote IPE cabinet



- 13** Disconnect the power cord from the wall outlet for the AC system or the DC power source for the DC system and reconnect the 6 AWG ground wire to the cabinet ground lug.
- 14** Reconnect the NTAK98AA supply power cord to the AC power outlet for an AC system or to the DC source for a DC system.
- 15** If the Carrier Remote IPE requires an expansion cabinet to accommodate up to 16 IPE cards, repeat steps 1 through 14 for the NTBK70 expansion cabinet.
- 16** Connect the NT1P70/NT1P60 main cabinet to the NTBK70 expansion cabinet by installing the cable between connector P1 of the main cabinet and P1 of the expansion cabinet. Install the cabinets side-by-side or above each other keeping in mind that the inter-cabinet cable is 7 feet (21 m) long.
- 17** Install the adhesive label strip to the expansion cabinet designating the card slots from 10 to 15.

This completes the cabinet installation and system ground test. You can now install the plug-in cards.

Removing the fiber I/O bracket assembly

The NT1P70/NT1P60 main Carrier Remote IPE cabinet is equipped with a I/O bracket assembly used in Fiber Remote IPE. This bracket must be removed and the NT7R94AA Remote Cabinet Cable Assembly must be installed in its place. Refer to [Figure 18](#).

To remove this bracket:

- 1** Unscrew the retaining screw holding the bracket in place. The screw is located at the upper front of the bracket.
- 2** Remove the retaining screw and swing the front of the bracket to the left by 45 degrees.
- 3** Slide the entire bracket forward to clear the hinge tabs at the rear of the bracket. Remove the bracket.

Installing the NT7R94AA Remote Cabinet Cable Assembly

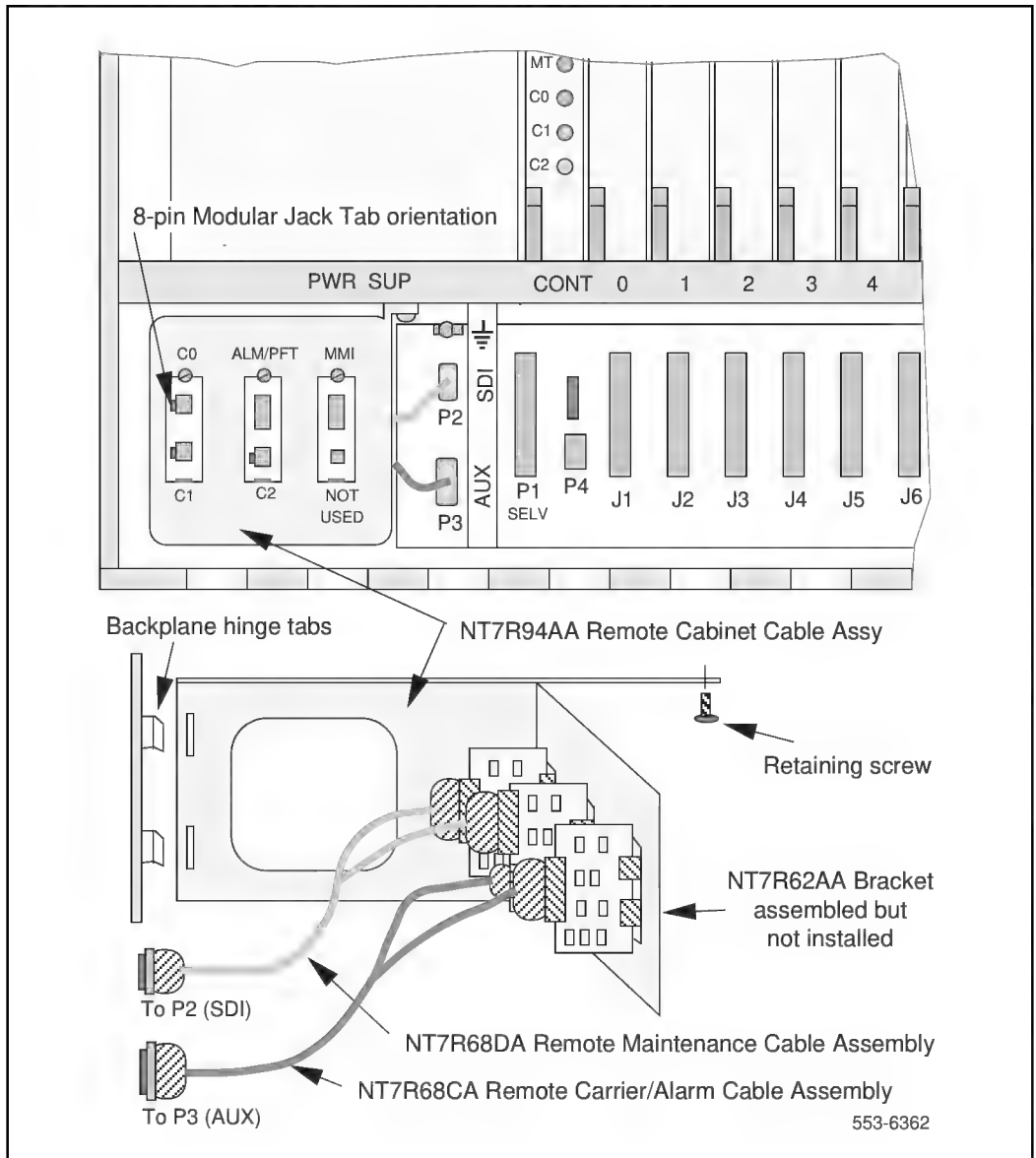
The NT7R94AA consists of the NT7R62AA Bracket, the NT7R68CA Remote Carrier/Alarm Cable Assembly, and the NT7R68DA Remote Maintenance Cable Assembly. These components are pre-assembled in the factory to become the NT7R94AA Remote Cabinet Cable Assembly.

To install the NT7R94AA Remote Cabinet Cable Assembly into the cabinet:

- 1 Align the two bracket holes with the two hinge tabs as shown in [Figure 18](#).
- 2 Swing the front of the assembly by 45 degrees to the left with respect to the hinge tabs.
- 3 Slide the entire assembly backwards and insert the hinge tabs into the two holes on the bracket.
- 4 Move the front of the assembly by 45 degrees to the right to be at the right angle to the backplane and install the retaining screw.
- 5 Plug the DB-15 male P1 connector at the common end of the NT7R68CA cable assembly into the P3 (auxiliary) DB-15 female connector located on the backplane.
- 6 Plug the DB-9 male P1 connector at the common end of the NT7R68DA cable assembly into the P2 (TTY) DB-9 female connector located on the backplane.

[Figure 18](#) shows an installed and connected Remote Cabinet Cable Assembly. The cables are connected to P2 and P3 located on the cabinet backplane to provide connections to carrier links, the SDI/MMI terminal or TTY, the PFTU, and the customer external alarms (alarms 1 and alarm 2 only).

Figure 18
Carrier cable routing for the Carrier Remote IPE cabinet



Installing cards into the Carrier Remote IPE cabinet

The following steps show you how and where to install the cards in the Carrier Remote IPE cabinet. Even though the cards are shipped in the cabinet from the factory, for safety and ease of installation, you were instructed to remove these cards from the cabinet before you installed it onto the wall.

To install these cards:

- 1 Set the DIP switches on the NT7R52 Remote Carrier Interface card to specify the carrier type (T1 or E1), the distance to the first repeater, the terminal characteristics, and the system monitor address emulation. The DIP switch setting will depend on the physical system configuration.

Note: Figure 15 on page 107, shows the location of the DIP switches and their functions. Switches 2, 3, and 4 determine if carrier 0 is a T1 or an E1 link, switches 4, 6, and 7 determine if carrier 1 is a T1 or an E1 link, and switches 8, 9, and 10 determine if carrier 2 (spare carrier) is a T1 or an E1 link. All three carrier links must be of the same type, that is, T1 or E1. Switches 2 through 10 are not read by firmware. Switches 1 and 11 define parameter listed in the table of [Figure 15](#). Verify that SW1 position 2 is set to **ON** to indicate remote site. Switches 1 and 11 are read by firmware.
- 2 Pull the Remote Carrier Interface card locking devices away from the faceplate and, holding the card by these devices, insert the card into the card guides in slot *Cont*. Refer to Figure 17 on page 120 for card slot positions in the shelf.
- 3 Slide the card into the cabinet until it engages the backplane connector and then push the locking device levers toward the faceplate to insert the card connector into the backplane connector and lock the card in place.
- 4 Observe the LED on the card as it performs self-tests. The LED should blink three times and then stay on until The Remote Carrier Interface card is enabled by software. When enabled by software, the LED turns off permanently, if the card is operational.
- 5 Install IPE cards in slots 0 through 9 by pulling the card locking devices away from the faceplate, inserting the cards into the card guides, engaging the backplane connector, and locking the card in place by pressing the locking devices against the card faceplate.
- 6 Repeat step 5 for card slots 10 through 15 in the expansion cabinet.

Connecting carrier links to the Carrier Remote IPE cabinet

In the Carrier Remote IPE cabinet configuration, the carrier link connects to the telco demarcation point and, from the telco demarcation point, the carrier link cables are routed to the cabinet and connected to the Remote Carrier Interface card through the NT7R59AA Carrier Panel and the NT7R60AA Carrier/Alarm Panel assemblies, as shown in [Figures 18](#) and [19](#).

Note 1: Before connecting the carrier link to the system, the connection between the telco demarcation point such as CSU, should have been completed using the NT7R87AA T1 CSU Cable Kit.

Note 2: To connect an E1 carrier terminated with BNC connectors, use the NT7R67EA Coaxial Interface Adapter Cable to connect the 8-pin modular jacks at the I/O panel to the BNC connector on each E1 carrier link coming from the telco demarcation point. Also refer to [Figure 9](#) and [Figure 15](#) to set SW1, SW2, SW5, and SW8 for E1 operation and carrier impedance of 75 Ohm.

To connect the carrier link to the carrier panel assemblies:

- 1 Route the T1 or E1 carrier 0, carrier 1, and carrier 2 (spare carrier) pair wires from the telco demarcation point to the Carrier Remote IPE cabinet I/O bracket.
- 2 Identify carrier 0, 1, and 2 connectors and the corresponding NT7R59AA Carrier Panel and the NT7R60AA Carrier/Alarm Panel assemblies connectors. Refer to “Verifying carrier link connections at the remote site” on page 147.

Note: Compare carrier circuit ID numbers of carrier links at the local site (that you recorded during the installation of the carrier links at the local site) with the carrier circuit ID numbers of the carrier links at the remote site. Make sure they match so that the circuit ID of carrier 0 at the local site matches with circuit ID of carrier 0 at the remote site. Repeat this matching for carrier 1 and carrier 2. This will eliminate the mismatched connection of carrier links, which causes time slot connection problems indicated by no talk-path or cross-talk. To avoid this problem, refer to “Verifying carrier link connections at the remote site” on page 147.

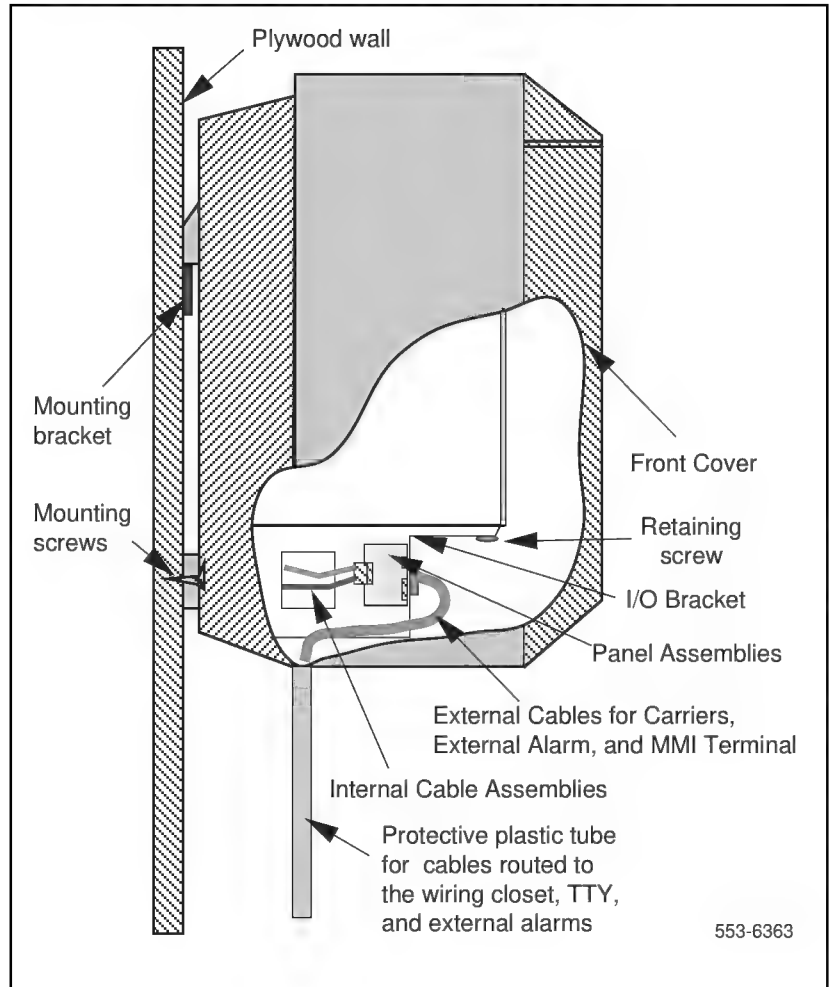
- 3 Plug the carrier link 8-pin modular plug into the corresponding NT7R59AA Carrier Panel and the NT7R60AA Carrier/Alarm Panel assemblies 8-pin modular jack for each carrier.
- 4 If an E1 coaxial carrier link is terminated with BNC connectors, use one NT7R67EA Coaxial Interface Adapter cable to connect each 8-pin modular jack on the NT7R59AA Carrier Panel and NT7R60AA Carrier/Alarm Panel assemblies to BNC carrier link connectors.
- 5 Identify BNC connectors on each NT7R67EA Coaxial Interface Adapter cable that corresponds to the appropriate carrier (carrier 0, carrier 1, and carrier 2) at the NT7R57AA Carrier Panel Assembly 8-pin jack.
- 6 Connect each NT7R67EA Coaxial Interface Adapter BNC connector to the appropriate BNC connector on the carrier link.

Note: These carrier link connections will be verified at the end of hardware installation by executing appropriate MMI commands on the MMI terminal. Refer to “Verifying carrier link connections at the remote site” on page 147.

- 7 Secure the carrier link cables with tie-wraps at the exit from the cabinet as appropriate.

Figure 19 shows the Carrier Remote IPE cabinet and the carrier cable connecting carrier links to the cabinet.

Figure 19
Carrier cable routing for the Carrier Remote IPE cabinet



Connecting remote MMI terminal and subscriber loop cables

In the Carrier Remote IPE cabinet option, the alarm monitoring is performed by the Remote Carrier Interface card, which receives power fail signals from the power supply through the backplane and sends the information over carrier links to the Local Carrier Interface card for processing by the Meridian 1 CPU. Refer to Appendix C, [Figure 30](#) for the connection diagram.

MMI terminal connection

A terminal connection to the MMI port should be made as shown in [Figure 20](#). The MMI terminal is used for configuration and maintenance of the remote site. The MMI terminal transmission characteristics are 2400 bps, 8 bits, no parity (or emulate the VT100 dumb terminal).

To connect the MMI terminal to the MMI port:

- 1 Plug the DB-9 female connector at one end of the NT7R66BA MMI Cable into the MMI DB-9 male connector on the NT7R61AA Maintenance Panel assembly.
- 2 Plug the DB-25 male connector end of the NT7R66BA MMI Cable into the MMI terminal RS-232 connector. If the MMI terminal requires a different gender connector use a compact gender changer.
- 3 If a distant MMI terminal is connected to the MMI connector on the Maintenance Panel Assembly over a modem, use the NT7R66BA MMI Cable and a DB-25F/DB-25M nullmodem to connect the modem to the MMI D-9 male connector on the NT7R61AA Maintenance Panel Assembly.
- 4 For multiple Carrier Remote IPE modules at a single site, use an A/B/C switch box to connect each MMI DB-9 male connector on the Maintenance Panel assembly to a single MMI terminal. To do this, use the NT7R66BA MMI Cable between the A/B switch box connector C and the MMI connector on the NT7R61AA Maintenance Panel Assembly and use DB-25M/ DB-25M straight through cable between the A/B switch box connector A and the MMI terminal.

Main Distribution Frame connections

To connect subscriber loop (tip and ring) cables to the cabinet 50-pin connectors J1 through J10, refer to [Figure 20](#). If an expansion cabinet is also used, connect subscriber loop (tip and ring) cables to the cabinet 50-pin connectors J11 through J16. These cables have already been connected to the MDF in the preinstallation preparation phase according to the instructions in “Cabling lines and trunks” in *Meridian 1 system installation procedures* (553-3001-210):

- 1 Remove the locking bar from connectors designated J1 through J10.
- 2 Install the 50-pin connector terminating the MDF cable marked J1 and plug it into the connector at the bottom of the cabinet also designated J1.
- 3 Repeat step 2 for the remaining MDF cables from J2 through J10 for card slot 1 through 9.
- 4 If the expansion cabinet is also installed, identify the 50-pin connectors terminating the MDF cable designated J11 through J16 and plug them into their respective connectors at the bottom of the cabinet also designated J11 through J16 for card slots 10 through 15.
- 5 Replace the locking bar(s) in the cabinet(s) over the cable connectors.

Auxiliary alarm connections

To connect the auxiliary or external alarm indicators to the NT7R60AA Carrier/Alarm Panel assembly connector, use the NT7R86AA Auxiliary Alarm Cable assembly:

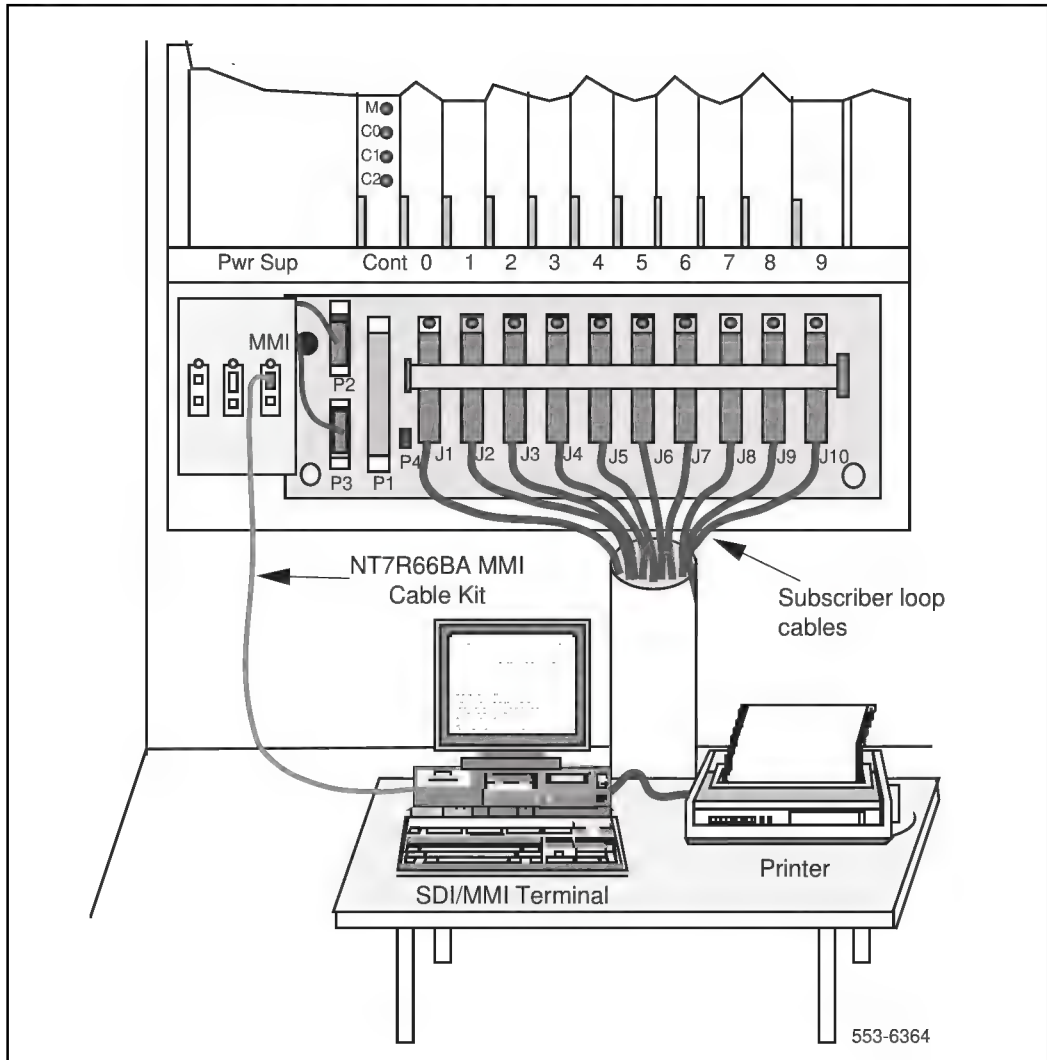
- 1 Plug the NT7R86AA Auxiliary Alarm Cable assembly DB-15HD male cable connector into the DB-15HD female connector on the NT7R60AA Carrier/Alarm Panel assembly. The DB-15HD connector pin assignment is shown in Appendix C, [Table 29](#).
- 2 Connect the other end of the NT7R86AA Auxiliary Alarm Cable assembly bare wires to the external alarm device terminals.

The customer auxiliary (external) alarms 1 and 2 are input only alarms that produce CRI33n1 and CRIn2 alarm messages when activated. These should be connected across open relay contacts. No external voltage should be present across the contacts.

The customer auxiliary alarm feature can be used for any premise alarm application where an alarm condition activates a relay contact closure.

Figure 20 shows the subscriber loop (tip and ring) connectors that link line cards to the MDF and the terminal connection. It also shows the MMI terminal connection to the NT7R61AA Maintenance Panel DB-9 connector.

Figure 20
TTY and subscriber loop cable connections



Connecting the attendant to the Carrier Remote IPE cabinet

The Carrier Remote IPE cabinet backplane contains P4, a 2-pin power connector which provides a +15 V and –15 V power source for the attendant console.

To make this connection:

- 1 Connect the attendant console power cord to P4 connector (± 15 V power pins) on the Carrier Remote IPE cabinet backplane.
- 2 Install and configure the attendant console. Refer to *Telephone and attendant console installation* (553-3001-215) and *M1250 and M2250 Attendant Consoles description* (553-2201-117).

Connecting the PFTU to the Carrier Remote IPE cabinet

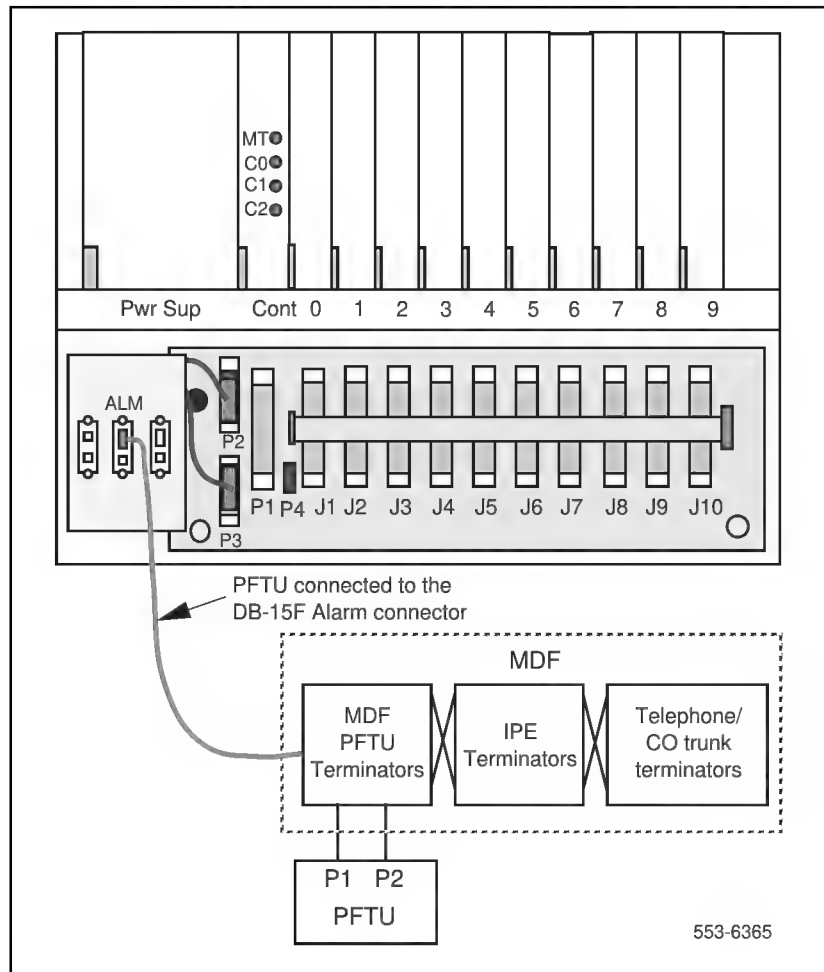
In the Carrier Remote IPE cabinet option, the Power Fail Transfer Unit (PFTU) is connected as shown in [Figure 21](#).

To make this connection:

- 1 Install the PFTU near the MDF and connect it to the MDF according to the instructions in the PFTU user manual.
- 2 Install the NT7R86AA cable between the PFTU and the NT7R60AA Carrier/Alarm Panel assembly connector DB-15 female (Alarm) connector on the Carrier Remote IPE cabinet. For more information on how to install the PFTU, refer to *Meridian 1 system installation procedures* (553-3001-210).

Figure 21 illustrates the front view of the Carrier Remote IPE cabinet. It shows the connection of the NT7R60AA Carrier/Alarm Panel assembly DB-15 female (Alarm) connector on the Carrier Remote IPE cabinet linking the cabinet to the PFTU and the MDF.

Figure 21
Connecting the PFTU to the Carrier Remote IPE cabinet



Configuring the Carrier Remote IPE

The configuration and administration of the Carrier Remote IPE and the corresponding carrier equipment at the Meridian 1 local site are identical to the standard Meridian 1 configuration and administration and do not require special considerations.

However, there are some initial setup functions that must be considered at the local and the remote sites. These functions are administered over a man machine interface (MMI) port connected to a terminal or a TTY at the local and the remote site.

When configuring Carrier Remote IPE functions at the local and the remote sites you can configure:

- Local and Remote Carrier Interface cards using Configuration Record programs LD 17 and LD 97
- Carrier parameters using the MMI commands

Configuring the carrier interface cards

When the Carrier Remote IPE equipment is first installed, you must define the Local Carrier Interface and Remote Carrier Interface cards as standard NT8D04 Superloop Network and NT8D01 Peripheral Controller cards.

To do this you must:

- print the current system configuration record to identify possible available superloops
- remove an existing superloop data block if it already exists for a non-carrier superloop

Note: To remove superloop data blocks, remove all terminal numbers (TNs) associated with the peripheral controller, disable the superloop, and remove the data block associated with the peripheral controller. You can also move data blocks of one superloop to a different superloop number using Move Data Blocks Program LD 25.

- configure a superloop data block to correspond to the Local Carrier Interface card
- configure a peripheral controller data block to correspond to the Remote Carrier Interface card

Before you can define a carrier superloop, you must find available superloops in the system. To do this, logon and print system configuration data using Print Program LD 22. If you don't know how to logon refer to [“Logging in on the maintenance terminal” on page 178.](#)

Request CFN printout

Prompt	Response	Comment
REQ	PRT	Print request
TYPE	CEQU PKG, PSWV	Configuration data

CFN configuration data print format- find unused superloop

CEQU		
MPED	SD/DD/4D/8D	Prints maximum peripheral density for the system (use 8D for systems with IPE)
TERM	xxx xxx xxx...	Prints all terminal loops
REMO	xxx xxx xxx...	Prints remote EPE loop numbers configured in LD 17
SUPL	xxx xxx xxx...	Lists all local Superloop Network card superloop numbers
SUPC	xxx xxx xxx	Lists all carrier remote superloops when REM_IPE 286 software package is installed
PKG		
REM_IPE	286	Software package for Carrier Remote IPE
PSWV		
XPEC:	XX	Software version number
LCRI:	XX	Software version number downloaded to Local Carrier Interface cards. A forced PSDL is initiated upon execution of the ENLL and ENXP commands (Note).

Note: Parameter Software Download (PSDL) ensures that the latest loadware is downloaded into the Local and Remote Carrier Interface cards. PSDL is initiated upon:

Initialization (INIT).

ENXP after power reset or the Local or Remote Interface card.

ENXP of the Remote Carrier Interface card by adding peripheral software version parameter after the Peripheral Controller ID.

ENLL of the Local Carrier Interface card by adding the PSW version parameter after the SUPC number.

To change the system configuration record and to configure the Remote Carrier Interface at the Carrier Remote IPE column or cabinet site, load Configuration Record Program LD 17 and Configuration Record Program LD 97.

To change the system configuration record (LD 17)

Prompt	Response	Comment
REQ	CHG	Change the configuration record
TYPE	CFN	Configuration record
CEQU	YES	Change equipment
MPED	8D	Peripheral density

To configure the Remote Carrier IPE site (LD 97)

REQ	CHG	Remote Carrier Interface definition
TYPE	XPE	Remote Peripheral Controller (RCI) ID
SUPL	0-156	Prints superloop type and number
XPEC	2	Controller ID number.
LOC	SCLARA	remote site location example. Use any six alphanumeric characters to identify the remote site.
RGTP	(8)/16	Number of concurrent ringers. Change to 16 unless ringing generator is an older type.

After you have you have defined the new Peripheral Controller (RCI) define the superloop for the Local Carrier Interface card.

To define a carrier superloop

Prompt	Response	Comment
REQ	CHG	Adding a new Local Carrier Interface card
TYPE	SUPL	Adding a superloop for the Local Carrier Interface card.
SUPL	0–156	Superloop number
SLOT	(L)/R	Superloop card side for the Local Carrier Interface card, where L (left) is default position.
SUPT	CARR	Carrier superloop type. Prompted when REM_IPE 286 software package is installed.
XPEC	1–95	Remote Carrier Interface card (Controller ID number) previously equipped. Defaults to shelf 0 segment 0-3 for SUPT = CARR

To configure the Carrier Remote IPE superloop and the Carrier Remote IPE column or cabinet site, load Configuration Record Program LD 17 and Configuration Record Program LD 97.

Configuring the SDI port for the Local Carrier Interface card connection (LD 17)

REQ	CHG	Change the SDI record
TYPE	CFN	Configuration record
IOTB	YES	
HIST		I/O terminal history file buffer length
ADAN	NEW/TTY 0–15	Add, change, or remove an I/O device, type aaa, or port x
USER	BUG, MTC, SCH	Enter one of the output message types that will be the message of this port
XSM	(NO)	SDI port for the system monitor

To enable the superloop for the Local Carrier Interface card and the Remote Carrier Interface card, load Maintenance and Diagnostic Program LD 32 and execute the **ENLL x** command.

To enable the carrier superloop x

Command	Response	Comment
ENLL x	ok & prompt	Enables specified superloop x

To remove the configuration of the Remote IPE superloop, load Maintenance and Diagnostic Program LD 32 and execute the **DISL x** command to disable the superloop, and then load Configuration Record Program LD 97 to delete the configuration records of the superloop for the Local Carrier Interface card and the Remote Carrier Interface card.

To delete the configuration record for the carrier superloop

Prompt	Response	Comment
REQ	CHG	Deleting the Local Carrier Interface card configuration record
TYPE	SUPL	Carrier superloop
SUPL	X8	Remove record for superloop number 8

To delete the configuration record for the Carrier Remote IPE module (shelf)

REQ	CHG	Change configuration record
TYPE	XPE	Remote Carrier IPE
XPEC	X2	Delete configuration record for peripheral controller 2, i.e., the Remote Carrier Interface card

To check the carrier status, loading the LD 32 and executing the **STAT <SUPC>**, where <SUPC> is the Local Carrier Interface superloop number. For additional examples of carrier status, refer to the Maintenance section, Procedure 7 “Checking the carrier performance status” on page 199.

LD 32

NPR000

STAT sl

CARR	CALS	TTSA	NND	SPARED
0	0	21/21	NO	NOT SPARED
1	0	21/21	NO	NOT SPARED
2	0	N/A	N/A	AVAIL

Parameter description:

CARR—Carriers 0, 1, and 2 (carrier 0 has priority over carrier 1 when sparing carrier links)

CALS—Carrier Alarm Status (0 indicates Alarm Level 0 indicates no alarm)

TTSA—Timeslots currently available for voice and data (n/21 for T1 and n/27 for E1)

NND—Indicates if No New Data is disallowed (NO = not disallowed)

SPARED Indicates if a carrier is spared (in the example none are spared) and N/A indicates that carrier 2 is primary not spare

Configuring the remote MMI terminal port

The MMI port can be configured in the SDI or the MMI mode. When the MMI terminal is in the SDI mode, you can perform system administration tasks from the local or the remote site. When the MMI terminal is in the MMI mode you can:

- perform carrier functions such as display status, logs, performance information, history, and messages
- enable or disable alarms
- clear errors and logs
- set performance parameters
- specify tests

MMI mode

In the MMI mode, a terminal or TTY is connected to the local MMI port at the Local Carrier Interface card and another terminal or TTY is connected to the MMI port at the Carrier Remote IPE as described in *Installing SDI and TTY cables* in this chapter. Each terminal controls the local MMI functions of the card it is connected to and some display functions at the distant site.

The default MMI interface characteristics are set in the Local and Remote Carrier Interface card EEPROM as follows:

- Speed: 2400 bps (speed is an exception, it is selected using DIP SW1 position 1 where OFF = 2400 bps and ON = 1200 bps)
- Character width: 7
- Parity bit: mark
- Stop bit: 1

The MMI mode is accessed from the initial (INIT) mode by entering **L** on the MMI terminal or TTY to log in. For multiple Local Carrier Interface cards connected in a daisy-chain, to log in to the specified Local Carrier Interface card, enter **L <sl>**, where **sl** is the address and the superloop number of the specified superloop, as shown in [Figure 22](#) and [Table 11](#), “[NT7R51 Local Carrier Interface card maintenance daisy-chain address,](#)” on page 70.

Password is **MILINK**

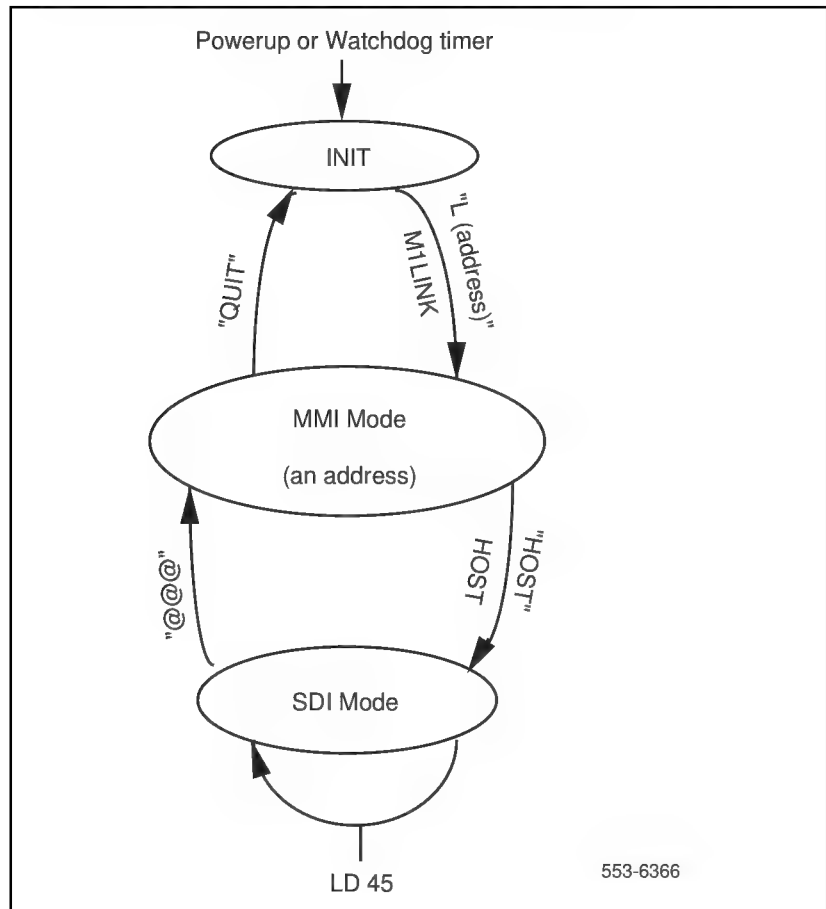
The MMI command line prompt in the initial mode is: **CRI>**, but after logging in, the prompt changes to: **CRI::>**

The prompt in a Maint/SDI daisy-chain configuration is **CRI: nnn>**, where **nnn** is the address of the LCI in the chain.

To exit the MMI mode and return to the INIT mode, enter **Q** at the terminal or TTY.

Figure 22 shows modes that a terminal or a TTY can be in and paths taken to transition from one mode to the next. The three modes are Initial, MMI, and SDI. The words in quotation marks shown along the paths must be entered on the terminal to go from one mode to the next.

Figure 22
TTY or terminal modes at the local and the remote sites



Host SDI mode

In the Host SDI mode, a terminal is connected to the MMI port at the Carrier Remote IPE. This terminal becomes the Meridian 1 maintenance and service change TTY. At the Meridian 1 site the Local Carrier Interface card connects to the MMI port and to an SDI port of an SDI card.

For the MMI port at the Remote Carrier Interface card to be able to communicate over the SDI port connected to the Local Carrier Interface card, the interface characteristics must be the same:

- Speed: 2400 bps or 1200 bps (Set by SW1 position 1)
- Character width: 7 bits
- Parity bit: mark
- Stop bit: 1

In this mode, the remote TTY or terminal becomes a Meridian 1 system TTY that can access overlays and perform system configuration, maintenance, and diagnostics, which are the same functions performed by the local Meridian 1 system TTY.

To log into the host for SDI operation, you should first log in using the MMI terminal in the MMI mode, then you should log into the terminal as host:

CRI>L	Login command
CRI::>	Prompt after logging in
Enter Password > M1LINK	Type in the password.
CRI::> HO	To access the Host SDI mode
Enter Password > HOST	Enter the password HOST

The Host SDI mode is accessed from the MMI mode by entering **HOST** at the terminal or TTY. In this mode you can configure and maintain the entire Meridian 1 system. [Figure 22](#) shows that, for example, LD 45 can be activated to perform loopback testing.

To exit this mode, enter **@@@**.

Configuring the carriers

To configure the Carrier Remote IPE using the MMI terminal, you must logon, enter the password, and use appropriate MMI commands.

Note: The commands are not case sensitive (you can use upper or lower case letters). The exception is the password, which must always be entered in upper case.

Default factory carrier configuration

Carrier 0 equipped
Carrier 1 equipped
Carrier 2 equipped (not a spare)
Alarms enabled (automatic clearing of Carrier Alarm Indication)

Before you start configuring the Carrier Remote IPE, you should check the current (default) configuration and determine whether the communication is established with the distant end. The S A and the S C commands affect the distant end automatically only when the distant end is communicating.

To display the configuration parameters, execute the **D C** command on the MMI terminal. This is an example of what the MMI terminal may display:

CRI::> D C

CRI Remote IPE S/N L1105-A4 Software Version 1.00 8/17/95 10:48
Local Site
Alarm Enabled: YES Self Clearing Enabled: YES
Sparing Enabled/Disabled: Enabled
All Link Maps Normal
Alarm Level 1 Threshold Value E-6 Threshold Duration (in seconds) 1
Alarm Level 2 Threshold Value E-5 Threshold Duration (in seconds) 1
Alarm Level 3 Threshold Value E-4 Threshold Duration (in seconds) 1
Frame Slip Alarm Level Threshold 100 Threshold Duration (in hours) 2
Current DIP Switch S1 Settings (s1-s8) OFF OFF ON ON OFF ON ON
OFF
Current DIP Switch S11 Settings (s1-s8) OFF OFF OFF ON ON OFF OFF
OFF

Unless you have a particular reason to change the default parameters, you should leave them unchanged.

Execute the **D C D** command for the distant site and compare the configuration settings at the local and the remote sites. If you are able to obtain the distant configuration report and they are both configured correctly, the MicroLink is up and the communication is established.

To also verify that the communication is established, display the status at each end of the carrier by executing the **D S** and **D S D** commands on the MMI terminal. If MicroLink is up (carrier is good end-to-end), the communication across the link is established.

To display local carrier status:

CRI:: > D S	Display carrier status
CRI Remote IPE S/W L1105-A4 Software Version 1.00 8/11/95 10:45	
Local Site	Status at the local site
In Alarm Status: NO	No alarms detected
All Link Maps Normal	No link has been spared
Link 0 Alarm Level 0	Carrier 0 status
Link 1 Alarm Level 0	Carrier 1 status
Link 2 Alarm Level 0	Carrier 2 status

To display remote carrier status:

CRI::> D S D	Display distant carrier status
Distant End Ready	Distant end acknowledged
D S	Command received
CRI Remote IPE S/W R1105-B6 Software Version 1.00 8/11/95 10:45	
Remote Site	Status at the remote site
In Alarm Status: NO	No alarms detected
All Link Maps Normal	No link has been spared
Link 0 Alarm Level 0	Carrier 0 status
Link 1 Alarm Level 0	Carrier 1 status
Link 2 Alarm Level 0	Carrier 2 status

[Table 15](#) lists MMI commands used to display and configure carrier parameters such as setting alarm thresholds, setting time and date, configuring carrier links, connecting to the SDI port, and testing the carriers and interfaces to the carrier link.

Table 15
MMI commands used in setting the carrier parameters

Command	Description
D C	Display configuration. Displays current configuration of the Local and Remote Carrier Interface cards.
D C D	Display configuration distant. Displays current configuration of distant Local and Remote Carrier Interface cards.
D S	Display status. Displays near-end carrier status.
D S D	Display status distant. Displays far-end carrier status.
L	Log into the MMI terminal when the system has one Local Carrier Interface card. The password is M1LINK.
L sl	Log into a specific superloop when the system has more than one Local Carrier Interface card daisy-chained in the network module. Refer to Figure 22 to see the path L (address). The password is M1LINK.
S A	Set carrier alarm threshold and duration parameters
S T	Set time or verify current time
S D	Set date or verify current date
S C	Set configuration
S N	Set site name and superloop
HOST or HO	Terminal in Host SDI mode. The password is HOST.
@@@	Terminates the Host SDI connection
T	Specifies a test from 1 to 5 to be run on the equipment
Q	Logs the terminal user out

To configure the carriers and specify carrier 2 as a spare carrier:

CRI > L	To login to the MMI terminal
Enter Password > M1LINK	Password is M1LINK
CRI:: >	Prompt requesting an MMI command
CRI::> S C	To set carrier parameters
Equipped carrier 0 (Yes or No) Y	Enable carrier 0. Enter Y to enable or N to disable.
Equipped carrier 1 (Yes or No) Y	Enable carrier 1.
Equipped carrier 2 (Yes or No) Y	To enable carrier 2
Enable #2 for Spare (Yes or No) Y	Defines carrier 2 as spare
Enable self clearing Alarms (Yes or No) Y	To enable/disable alarm clearing

To configure the carrier alarm thresholds. Defaults threshold values are set in the factory and should not be changed unless there is a good reason for doing so:

CRI:: >	Prompt requesting an MMI command
CRI::> S A	To set carrier alarm parameters
Alarm 1 Threshold: Current value E-6 New value E-6	
Threshold Duration (in seconds) Min –1 Max – 3600 Current value 1	
Alarm 2 Threshold: Current value E-5 New value E-5	
Threshold Duration (in seconds) Min – 1 Max – 2148 Current value 1	
Alarm 3 Threshold: Current value E-4 New value E-4	
Threshold Duration (in seconds) Min – 1 Max – 218 Current value 1	
Frame Slip Threshold (Min – 1 Max – 255) Current Value 255	
Frame Slip Threshold Duration (in Hours) Min – 1 Max – 24 Current Value 1	

Note: Threshold Duration parameter for BER thresholds should not be longer than 10 seconds to allow fast recovery of a faulty carrier when the bit error rate improves. For example, if the duration is set to one hour, a faulty carrier that starts operating correctly will wait one 1 hour before the alarm condition is cleared and the carrier becomes available for traffic again.

Parameter values explanation:

Alarm 0—No alarm, the carrier is operating without bit errors and without excessive out of frame. If carrier was previously spared it is automatically unspared.

Alarm 1—The alarm indicates a low bit error rate (BER maintenance threshold). The transmission continues without trying to spare this link. Carrier maintenance should be scheduled. The alarm LED comes ON.

Alarm 2—Bit error rate is high and the carrier is automatically spared if the spare carrier is available (BER No New Data Calls). Otherwise, the carrier continues to operate normally for voice calls but no new data calls are allowed on this carrier.

Alarm 3—Very high bit error rate (OOS: BER, LOF, LOS, Blue Alarm, Excessive Frame Slip). If the spare carrier is available, this faulty carrier will be spared. Otherwise, the carrier is placed out of service and all calls on this carrier are disconnected.

Alarm Threshold—Number of bipolar violation. E-6 represents 10^{-6} or 1 error in 1 million bits, E-5 represents 10^{-5} or 1 error in 100,000 bits, and E-4 represents 10^{-4} or 1 error in 10,000 bits.

Threshold duration—Carrier signal monitoring duration (1 second to 3600 seconds) to detect bipolar violation errors. The error counter is updated every second for the length of the threshold duration.

Frame Slip Threshold—Number of controlled carrier frame slips allowed in a given time duration. Preferred threshold is 255.

Frame Slip Threshold duration—Carrier frame synchronization monitoring duration (1 hour to 24 hours) to detect the number of frame slips specified by the Frame Slip Threshold. Preferred duration is 1 hour.

The fewer the bipolar violations and/or frame slips, the better the carrier link performance. Based on the frequency of errors and frame slips, the specified thresholds determine the occurrence of Alarm 1, Alarm 2, and Alarm 3.

Alarm Disable command If the Maintenance LED comes ON and stays ON, a possible cause may be that the Alarm Disable (A D) command has been executed, which causes this condition.

To configure time and date:

CRI:: >	Prompt requesting an MMI command
CRI::> S T	To set time
Current Time 10:06:14 10:15:25	Enter correct time at the cursor, if required.
Current Time 10:15:25	
CRI::> S D	To set date
Current Date 8/10/95 18/11/95	Enter correct date at the cursor, if required.
Current Date 8/11/95	
CRI::> S N	Set site name
Change Site Name (Yes or No) Y	Change name or add name if not previously entered.
Enter Site Name SFO	

Note: Time and date should be set correctly to allow correlation of the Carrier Remote Interface Alarm Log with error messages in the Meridian 1 History File.

Verifying carrier link connections at the remote site

When all the carriers are connected and equipped, all carrier alarm LEDs may be turned OFF and the signaling across the link will work even though there may be a mismatch in carrier link connection between the local and remote ends. However, the voice and data connections may not work due to the scrambling of the time slots, which are assigned to specific carriers and cannot be used by other carriers. However, Carrier Test 1 may not show any errors under these conditions.

Note: All carriers will show Out of Frame alarm if the Local Carrier Interface card faceplate ENB/DIS switch is set to DIS. Carrier clocking is enabled when the switch is set to ENB. Carrier alarms may clear even while the Local Carrier Interface card is not software enabled when the switch is set to ENB.

All equipped carriers have been previously connected and configured at the local site and the carrier circuit ID recorded for each link 0-2. All carrier facilities (carrier links) should have been installed and tested by the carrier network provider up to the demarcation point at both ends.

To insure that all equipped carrier links are connected to their corresponding I/O panel connectors at the remote site, you must identify, test, and tag each carrier link individually as follows:

- 1 Configure all equipped carrier links by executing the **S C** (Set Configuration) command. Any unused carrier links must be configured as “unequipped” to prevent the carrier alarm LED from being constantly ON. Configure carrier #2 as spare or primary (not spare). Default parameters should not be changed unless you have a good reason for changing them.
Execute the **D C** (Display Configuration) command to verify the configuration.
- 2 Identify the circuit ID for carrier #0 at the carrier network demarcation point and connect the corresponding patch cable to the I/O panel connector (8-pin modular jack) for carrier #0.
- 3 Observe the carrier alarm LEDs on the faceplate of the Remote Carrier Interface card. Initially carrier alarm LEDs for all equipped carrier links should be ON due to Loss-of-Signal. The LED for carrier #0 should be turned OFF approximately 10 seconds after the patch cable for the selected carrier #0 is plugged into the Remote Carrier Interface card I/O panel connector for carrier #0.
If a good quality signal is received by both the Remote Carrier Interface card and the Local Carrier Interface card on carrier #0, the link is installed in the appropriate I/O panel connectors at both ends. If the connection is mismatched (carrier #0 at one end connects to carrier #1 or #2 connectors at the other end), the alarm LED will remain ON.
The LED also remains ON if there is a carrier alarm on the Remote Carrier Interface card (near end), however, the LED is turned OFF if there is no carrier alarm on the Remote Carrier Interface card (near end) and communication cannot be established across the link due to alarm on the Local Carrier Interface card (distant end).
Distant end carrier alarms cause the near end LED to turn ON only if the Remote Carrier Interface card and Local Carrier Interface card can communicate.

- 4 Test the carrier 0 link by executing the carrier status commands (**D S**-display carrier status and **D S D**-display carrier status distant) using the MMI terminal. Compare the carrier status on both the Remote Carrier Interface card (near end) and the Local Carrier Interface card (far end). Refer to “Configuring the carriers” on page 141 to see the displays of these two MMI commands. There are four possible conditions:
 - If the LED for carrier #0 is OFF and the Remote Carrier Interface card and Local Carrier Interface card have establish signaling communication, both ends will show “No Alarm” for carrier #0 and “Loss of Signal” for carrier #1 and carrier #2. No mismatch.
 - If the LED for carrier #0 stays ON due to a mismatch, the Local Carrier Interface card (far end) will show “Loss of Signal” for carrier #0 and “No Alarm” for carrier #1 and carrier #2.
 - If the LED for carrier #0 stays ON due to a carrier alarm condition on the Remote Carrier Interface card (near end), the **D S** command will show the type of carrier alarm on carrier #0, and the **D S D** command cannot retrieve the far end status.
 - If the LED for carrier #0 Remote Carrier Interface card (near end) is OFF but the Remote Carrier Interface card and the Local Carrier Interface card cannot establish communication due to a carrier alarm condition on the Local Carrier Interface card (far end), the **D S** command will show “No Alarm” on the carrier #0 on the Remote Carrier Interface card (near end), and the **D S D** command cannot retrieve the far end status.
- 5 Disconnect the patch cable from the I/O panel connector for the carrier #0 that was just tested and repeat steps 1 through 5 for carrier #1 and carrier #2 as equipped before proceeding to step 6.
- 6 Any carrier faults must be isolated and corrected. In case of mismatched carriers, the patch cables must be traced to the demarcation point at each end, and the carrier circuit IDs verified at both ends to determine which end of the carrier has been miswired or incorrectly identified.
- 7 After all carriers have been identified and labeled at the I/O panel connectors, they should all be plugged into the proper I/O panel connectors for the Remote Carrier Interface card and tested individually using the MMI Carrier Test 3 (Remote Loopback). Refer to Procedure 9 “Testing the carriers” on page 201.

The carrier links are now connected correctly. This will be further established during acceptance testing when the actual calls are made to verify the voice and data transmission across the carrier links.

Display current carrier equipment configuration

Before you conclude the installation and configuration of the Carrier Remote IPE, re-verify the configuration parameters and make sure that they are set properly.

To display the configuration parameters, execute the **D C** command on the MMI terminal. This is an example of what the MMI terminal may display:

CRI::> D C

CRI Remote IPE S/N L1105-A4 Software Version 1.00 8/17/95 10:48

Local Site (*Note*)

Alarm Enabled: YES Self Clearing Enabled: YES

Sparing Enabled/Disabled: Enabled

All Link Maps Normal

Alarm Level 1 Threshold Value E-6 Threshold Duration (in seconds) 1

Alarm Level 2 Threshold Value E-5 Threshold Duration (in seconds) 1

Alarm Level 3 Threshold Value E-4 Threshold Duration (in seconds) 1

Frame Slip Alarm Level Threshold 100 Threshold Duration (in hours) 2

Current DIP Switch S1 Settings (s1-s8) OFF OFF ON ON OFF ON ON
OFF

Current DIP Switch S11 Settings (s1-s8) OFF OFF OFF ON ON OFF OFF
OFF

Note: When the **D C** command is executed for the Carrier Remote IPE cabinet at the remote site, it displays “XSM Emulation Active”.

Parameter values explanation:

Alarm Enabled—Alarm monitoring and logging is enabled. CRI messages are enabled.

Self Clearing Enabled—The alarm indicators (LED and external contact closure) will automatically clear when the operational alarm level is cleared.

Sparing Enabled/Disabled—Carrier 2 is enabled or disabled as a spare carrier.

All Link Maps are Normal—No link has been spared. This is always the case when carrier 2 is configured as a primary carrier link.

Alarm Threshold—Number of bipolar violations. E-6 represents 10^{-6} or 1 error in 1 million bits, E-5 represents 10^{-5} or 1 error in 100,000 bits, and E-4 represents 10^{-4} or 1 error in 10,000 bits.

Threshold duration—Carrier signal monitoring duration (1 second to 3600 seconds) to detect bit error rate (CRC and BIPV) exceeding threshold. The error counter is updated every second for the length of the threshold duration.

Frame Slip Threshold—Number of carrier frame slips allowed in a given time duration.

Frame Slip Threshold Duration—Carrier frame synchronization monitoring duration (1 hour to 24 hours) to detect the number of frame slips specified by the Frame Slip Threshold.

Current DIP Switch S1 and S11 Settings—Shows the setting of switch positions 1 through 8 for both SW1 and SW11 of the Local Carrier Interface card if you are displaying the local site or SW1 and SW11 of the Remote Carrier Interface card if you are displaying the remote site.